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THE TRUE BOOK ABOUT ARCHAEOLOGY

by
P. E. CLEATOR

28529

Illustrated by
THE AUTHOR



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FREDERICK MULLER LIMITED
LONDON

FIRST PUBLISHED BY FREDERICK MULLER LTD.
PRINTED IN GREAT BRITAIN BY EBENEZER BAYLIS AND SON, LTD.
THE TRINITY PRESS, WORCESTER, AND LONDON
BOUND BY THE DORSTEL PRESS LTD., HARLOW



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CONTENTS

CHAPTER	PAGE
1. THE BEGINNINGS OF ARCHAEOLOGY .	9
2. WAYS AND MEANS	26
3. PROBLEMS OF DECIPHERMENT . .	43
4. THE PREHISTORIC PERIOD . . .	60
5. PEOPLES OF THE NILE	75
6. THE LAND BETWEEN THE RIVERS .	94
7. ENTER THE GREEKS	112
8. THE AMERINDIANS	128

Recd. from M.B. Lakshminarayanaiah, Bangalore, 1955

LIST OF ILLUSTRATIONS

	PAGE
THE RUINS OF POMPEII	15
THE GREAT SPHINX OF GIZEH	21
PLAN OF THE SERAPEUM	23
PLAN OF THE VALLEY OF THE TOMBS	29
TUTANKHAMON'S TOMB	33
RADIOACTIVE DECAY	39
EGYPTIAN UNICONSONANTAL SIGNS	47
HITTITE HIEROGLYPHS	57
UNDECIPHERED SCRIPTS	59
STONE AGE IMPLEMENTS	67
MAGDALENIAN CAVE DRAWING	68
BUSHMAN PAINTING	73
MAP OF THE NILE VALLEY	79
ANCIENT EGYPTIAN WRITINGS	89
THE TEMPLE OF KOM-OMBO	93
MAP OF THE TIGRO-EUPHRATES VALLEY	95
HEAD OF ASHURNASIRPAL II	103
THE MOUND OF BABIL	111

MAP OF THE AEGEAN AREA	.	.	.	114
CRETAN WRITING	.	.	.	121
EVOLUTION OF THE ALPHABET	.	.	.	126
THE MIGRATIONS OF MANKIND	.	.	.	130
BRIDGE OVER THE APURIMAC RIVER	.	.	.	135
MAYAN NUMERALS	.	.	.	143

Chapter One

THE BEGINNINGS OF ARCHAEOLOGY

MODERN HISTORY is usually considered to date from A.D. 1453, the year which saw the Turkish capture of Constantinople (ancient Byzantium, now Istanbul), an event which led to a revival of the arts in Italy and elsewhere in Western Europe. Medieval History covers the preceding Dark and Middle Ages (6th-15th centuries) which followed the collapse of the Roman Empire, while events prior to the fall of Rome come under the heading of Ancient History—which last it is one of the functions of archaeology to serve.

Broadly, the task of archaeology (a word derived from the Greek meaning "a study of beginnings") is to investigate the remains of past human activity, from the first appearance of man on earth to the Middle Ages. The interests of the archaeologist are thus intermediate between those of the anthropologist (who is primarily concerned with man in his primitive state) and of the historian (who necessarily deals with the happenings of more civilized times).

Some idea of the extent and value of archaeological discoveries made during the last century

may be gathered from the fact that, up to about one hundred years ago, Ancient History began with accounts of Greece and Rome. Speculation about the existence of earlier civilizations was discouraged by the widely held belief that the world and its occupants had been brought abruptly into being in the course of the last 6,000 years—at 9 o'clock precisely on an October morning in 4004 B.C., according to the estimation of one eminent authority.

Today, however, all such notions stand completely discredited, for it has been shown beyond doubt that the age of the earth is to be reckoned, not in thousands, but in millions of years. And these geological findings have been supplemented by archaeological discoveries which have brought to light documentary evidence relating to empires which long antedate those of Greece and Rome, so that the historic period in respect of parts of Africa and Asia now extends back for 5,000 years and more.

Five thousand years is a not inconsiderable interval, but by a most conservative estimate mankind has been in existence for at least one hundred times as long as this, and there is thus revealed a vast period of human activity about which the historian, dependent as he is upon written documents, can tell us nothing.

But the archaeologist, who suffers from no such limitation, has been able to learn much about our remote forebears by taking note of some of their prehistoric attainments—the tools they devised, the weapons they used, the clothes they wore—during the long and arduous transition from near ape to

modern man. And while, archaeologically, the invention of writing marks the beginning of a new epoch, it should always be remembered that the terms "historic" and "prehistoric", as applied to cultures which do, or do not, provide decipherable written records, are essentially regional in their application. The ancient Britons, for example, were first introduced to writing by the Romans, by which time (first century B.C.) the graphic art had been practised in some other parts of the world, notably Egypt and Mesopotamia, for more than 3,000 years.

An outline of the story of how the more important of these ancient scripts came to be discovered and deciphered will be given later. In the meantime, it may be noted that it is evident from these accounts that an interest in the past is no novelty. One hoary document tells of the adventures of Prince Setna-Khaemuast, a son of Rameses II of Egypt, who more than 3,000 years ago defied the spirits of the dead by entering a royal tomb in order to recover a roll of papyrus, supposedly endowed with magical properties, which had been buried with its owner.

It is known, too, that the warlike Assyrian monarch Ashurbanipal, proud of his ability to read and write Accadian cuneiform, established an extensive library in his capital city of Nineveh in 650 B.C. or thereabouts, and despatched scribes far and wide in search of historic and other records with which to stock it.

And a century later, we find the Princess Bel-Shalti-Nannar, daughter of Nabonidus, King of Babylon, in charge of a museum in which relics of

the past were stored, while Nabonidus himself has left an account of how, during the carrying out of repairs to an ancient temple, there was discovered at a depth of 18 cubits (about 30 feet) a foundation stone which a royal predecessor, one Naram-Sin, had laid some 2,000 years before!

Historians continued to find favour at Court as first Persian, then Greek, and eventually Roman arms dominated the known world, but, with the downfall of the Roman Empire, an interest in the events of the past ceased to be shown. This sorry state of affairs persisted until the imminent surrender of Constantinople led to an exodus of many of the city's Greek inhabitants, some of whom contrived to make their way to Italy, carrying the seeds of a revival of learning with them. At all events, there was a renewal of interest in the glories of earlier days during the ensuing Renaissance period, when it became the fashion for high dignitaries of church and state to decorate their gardens with sculptures recovered from the ruins of Rome, a vogue which eventually spread to other and less exalted private collectors in neighbouring countries, while in England Henry VIII in due course appointed one John Leland to the post of "King's Antiquarian", and authorized him to search for ancient documents and the like.

But long before this, a lively interest had been taken in Stonehenge, as is shown by the fact that the monument is somewhat fancifully illustrated in a fourteenth century manuscript, no less fancifully inscribed *Stonehenge near Amesbury situated in England. This year (483) Merlin brought the Giant's Dance by art not*

force from Ireland to Stonehenge. The alleged association with Merlin the Wizard is, needless to say, imaginary. Later authorities were also in error when they attributed this Bronze Age structure to the Iron Age Druids, some of whom, of course, may have taken possession of it in later years, and thereafter claimed it as their own.

Among the tremendous happenings of the past which, though recorded at the time of their occurrence, had come to be forgotten, was a disaster which took place in A.D. 79. In that year, the supposedly extinct volcano Vesuvius, after a series of ominous rumblings, suddenly erupted with great violence. Showers of hot pumice fragments then began to rain down on the surrounding countryside, accompanied by poisonous fumes which killed many hundreds of people. Fortunately, although two sizable towns lay directly in the path of the bombardment, the majority of the citizens managed to flee in time, and so escaped with their lives. But when all was over, and it was deemed safe to return, the entire region was found to be blanketed by a 16-foot deep layer of pumice and volcanic ash, above which only the tops of the taller buildings protruded.

Attempts by the homeless to rescue their dwellings by digging them out were abandoned when the immensity of the task became apparent, and in the years which followed, all recollection of the whereabouts of the two doomed communities was lost. Even when a couple of inscriptions were found in the vicinity, at the end of the sixteenth century, no particular notice was taken of the find, and the

hidden towns remained undisturbed for another 150 years.

But towards the end of the first half of the eighteenth century, the existence first of Herculaneum, and then of Pompeii, was unexpectedly revealed, whereupon much shaft sinking and tunnelling was done, and many items of value recovered. And as may be imagined, when the full significance of the discovery was realized—two entire cities, much as the ancient Romans had so precipitately left them—it created a sensation, though it was not until 1763 that the unearthing of a reference to the tribune Suedius Clemens, who had been sent on a mission to Pompeii by the Emperor Vespasian, revealed the identity of the second of the two buried communities.

In the meantime, the visible remains of cities and towns older by far than those of Herculaneum and Pompeii had begun to attract the attention of European travellers to the land of Egypt. One of the first of these visitors, Bartholomeus de Salignace, made a cursory inspection of the pyramids of Gizeh as early as 1550. But at that time, and for many years afterwards, the country was in a very unsettled state, and the danger from bands of lawless robbers was considerable. Any attempt to stray far from Cairo and other main centres was thus highly imprudent, as N. L. Norden discovered when in 1738 he sought to investigate the ruins of once mighty Thebes, for he found the place infested by bandits.

Nevertheless, a succession of daring travellers—Jean Palmerme, Nicholas Shaw, Richard Pococke, Carsten Niebuhr, and James Bruce among them—



The ruins of Pompeii—the Via dell'Abbondanza, leading to the Forum

explored much of the country, and gave accounts of some of the many wonders they had beheld there. Considerable interest was thus aroused, at which juncture Napoleon Bonaparte, persuaded at last of the impracticability of launching a direct attack against England, struck at her Indian possessions by way of Egypt. The year was 1798.

At the time of this aggression, Egypt had been a part of the Ottoman Empire for nearly three centuries, and among those who were sent to repel the French invaders was an Albanian officer in the Turkish service, by name Mohammed Ali. After the defeat of Napoleon (thanks to British intervention), this junior officer contrived to make himself Commandant of the most powerful military force in Cairo, and in 1805 he succeeded in overthrowing the Pasha, a *coup* which was reluctantly acknowledged by the Sultan in Constantinople. The supplanted governor fled to the Turkish capital, but his Mameluk bodyguard remained in Egypt, and in 1811 Mohammed invited them to a banquet to be held in the citadel of Cairo, a strongly guarded fortress which had been built by the famous Saladin (Salahad-Din).

About 350 of the unsuspecting guests were received with much ceremony in the great hall, but no sooner had they been trapped within by the raising of the drawbridge than they were shot down by hidden marksmen as they tried vainly to escape. By all accounts, one or two did manage to get away, but from then on, Mohammed was supreme.

Although the French attempt to seize Egypt ended in failure, Napoleon, to his credit, had

shown an interest not merely in conquest, but also in culture, and among his followers there had been scores of scholars and savants as well as hundreds of soldiers. And for a time at least, his men of science, sheltering behind the guns of the accompanying army, managed to conduct their investigations without undue interference from troublesome outlaws. The outcome was a multi-volume work entitled *Description de l'Egypte*, published by the French Academy early in the 19th century. It was the first systematic account of the monuments of the Pharaohs, and it directed world attention to the Nile Valley, and to the remains of the ancient civilisation which had once flourished there.

The first to appear on the Egyptian scene, however, were numbers of individual excavators, the main purpose of whose activities was the enrichment of themselves, rather than the enrichment of science. Novel and unusual relics were beginning to command high prices, as the demand for such items increased, and a brisk trade in papyri, coffins, and mummies soon developed.

Foremost among the purveyors of Egyptian antiquities was Bernardino Drovetti, an Italian who had adopted French nationality, and who had served as a colonel under Napoleon. He was joined by Giuseppe Passalacqua, a fellow countryman who had come to Egypt intent upon dealing in horses, but who had found on arrival that trafficking in relics was more profitable. Yet a third Italian national, the redoubtable G. B. Belzoni, also joined in the work. After acting for a time as the strong man in a circus in England, he had conceived the

idea of persuading Mohammed Ali to invest in a hydraulic machine. The failure of this project left its hopeful author at a loose end in a strange country, at which crisis in his career he was introduced to Henry Salt, the recently appointed British Consul-General in Egypt, who employed the Italian to collect antiquities.

Belzoni had already done some exploring on his own account, and in 1817 he again journeyed up the Nile to the rock hewn temples of Abu Simbel, earlier noted by the Swiss traveller J. L. Burckhardt.

The entrance was completely hidden by a mountain of sand, and attempts to enlist the services of local labour having proved unsatisfactory, Belzoni and some companions, assisted by the native crew of their Nile boat, undertook the task themselves. After several days of strenuous digging, they laid bare a wall, but at first could find no sign of an opening. This, however, was eventually found after further work, and it gave access to a hall, carved out of the solid rock, the roof supported by a double row of square pillars, beside each of which was an outsize stone figure whose carved headdress reached the 20-foot high ceiling.

After this success, Belzoni went to Thebes, and gave his attention to a secluded region on the west bank of the Nile known as Biban el-Moluk (the Valley of the Tombs of the Kings) where a number of royal sepulchres had long been known to exist.

Here, noting a likely looking spot, he directed his labourers to excavate among some debris at the foot

of a steep part of the Valley wall, thus bringing to light the mouth of a tunnel. As soon as he was able, Belzoni wormed his way inside, and, on lighting a torch, found that he was standing in a long corridor, the walls of which were decorated with hieroglyphs. The passage sloped downwards to a flight of steps, and ultimately led to a square pit, 30 feet deep. On the far side of this chasm, a gaping hole made in a painting on what had been a plaster panel indicated that other marauders had discovered a secret room, and that the passage was by no means at an end.

The next day, by way of an improvised bridge, the pit was crossed, and the impatient explorer reached a hall, beyond which were a series of other rooms, interconnecting passages, and stairs. And in one of the chambers stood a sarcophagus, or stone coffin, its broken lid beside it. The discoverer persuaded himself that he had happened upon the tomb of the Pharaoh Psammis (Psammetichus), but as we now know, it was in fact that of the mighty Seti I, one of the outstanding figures in Egyptian history.

The Italian next achieved the distinction of being the first in modern times to force his way into the interior of the second of the trio of pyramids at Gizeh. The first and largest of these structures, the tomb of Kheuf (or Cheops), had for centuries been open to the world, thanks to the mining operations of Mamun the Great in A.D. 818.

Spurred on by the belief that much gold was concealed within, the Arab leader had laboriously tunnelled into the man-made mountain of stone

for more than one hundred feet, until at last one of the interior passages was encountered.

Belzoni, hopefully observing that the second pyramid (of Khefre) was seemingly intact, attacked it in a like manner, and after a month of sustained effort, succeeded in reaching the burial chamber. But all he found for his trouble was an empty sarcophagus, mute but unmistakable evidence that he had been anticipated in his visit.

The third pyramid (of Menkeure) yielded much the same result, when a way into it was forced by Howard Vyse nearly 20 years later.

The havoc caused by the indiscriminate activities of Belzoni and his companions, in what was virtually undisturbed archaeological territory, is something which does not now bear contemplation. Suffice it to say that incalculable damage was done, and irreplaceable losses caused, by the carefree plundering which everywhere ensued, as the rival adventurers disputed among themselves about the discovery of this or that burial place, and over the ownership of this or that find.

The locating of the sealed door of a tomb, as Belzoni in his published account of what it pleased him to call his researches freely admits, was the signal to batter it down with a ram of palm logs, while, once admission was gained, the unconcerned trampling underfoot of mummified remains was as likely an occurrence as not.

But the early days of exploration in Egypt were not entirely given over to vandalism. In 1844, following in the wake of Napoleon's savants, a German expedition under Richard Lepsius made a careful

survey of the Valley of the Tombs of the Kings, which royal necropolis both James Bruce and the French had found to be the haunt of robbers. Other surveys were made by Rosellini and Champollion,



The Great Sphinx of Gizeh. For centuries this monument lay buried in sand, with only its much mutilated head exposed. When it was excavated, the figure was found to be located in an ancient quarry. It is believed to be a representation of one of the early Pharaohs, possibly Khefre, of the 4th Dynasty.

in the course of which the last-named, as the decipherer of the hieroglyphs, paid particular attention to the inscriptions on the monuments.

Meanwhile, the Great Sphinx, that famous and

enigmatic carving with the head of a Pharaoh and the body of a lion, had been rescued from the encroaching desert sands which all but completely buried it. Assisted by funds subscribed in Britain, G. B. Caviglia, a Geneose mariner, cleared the ancient quarry in which the monument reclined, and in so doing discovered a processional way leading to a small temple, located between the front paws.

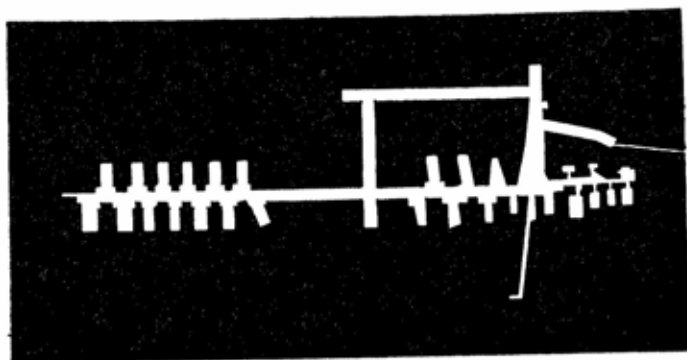
Some years later, in 1837, Howard Vyse, apparently in the expectation that the sandstone body housed one or more secrets internally, bored a hole in its back to a depth of nearly 30 feet. But all he encountered was solid rock.

Thus far there had been little or no real excavation in Egypt, but at least the uncontrolled activities of Belzoni and his fellow adventurers were nearing their end. The turning point came in 1858, when Mariette was appointed head of the Service of Antiquities, and promptly decreed that all unauthorized digging must cease.

Auguste Ferdinand Francois Mariette, an ex-schoolmaster, had been sent to Egypt nine years earlier by the Egyptian Department of the Louvre, charged with the task of buying Coptic manuscripts. In the course of his journeyings he reached Memphis, where he chanced to see the head of a miniature stone sphinx sticking out of the sand. The sight of this monument at once reminded him of a passage in the well known *Geography* of Strabo, wherein the Greek historian, who had himself visited Egypt about 24 B.C., remarked:

There is also a Serapeum at Memphis, in a place so sandy that dunes of sand are heaped up by the winds: and by these some of the sphinxes which I saw were buried even to the head and others were only half-visible. . . .

Could it be, Mariette asked himself, that the sand-covered sphinx at his feet was one of those to



Plan of the Serapeum at Memphis. The narrow entrance passage, shown on the right, leads to a maze of rock-hewn corridors and passages, in which the bodies of the sacred animals were laid to rest. Twenty-four giant sarcophagi were discovered in the side chambers.

which Strabo referred, and that it pointed the way to the famous Memphis Serapeum (temple) and its associated Apis (sacred bull) cemetery?

There was but one way to find out, and, with all thought of his mission vanished from his mind, Mariette hired a gang of workmen and set them to clearing away the sand. In the event, fortune favoured him, for, by the time the funds with which

he was supposed to purchase manuscripts were exhausted, it was evident that the money had been well spent. Among other things, there had been brought to light the entrance to a series of extensive underground vaults, the walls of which were lined with niches containing immense granite and limestone coffins, in which the bodies of the sacred animals had been laid to rest.

Mariette remained in charge of the Department of Antiquities for more than 20 years, during which he undertook excavational work at the stupendous Der el-Bahri temple of Queen Hatshepsut, and at many other sites, including Abu Simbel, making not a few notable discoveries in the process.

But although he effectively put a stop to the wholesale plundering of Egypt's ancient treasures, the methods he himself employed were often of a most summary nature, and it remained for others to devise and introduce the niceties of archaeological excavation which are now everywhere the accepted rule.

Outstanding among the advocates of method and precision was W. M. Flinders Petrie, who arrived in Egypt from England on the eve of the death of Mariette and his replacement as head of the Department of Antiquities by Gaston Maspero, in 1881.

Following the precepts of A. H. Rhind, a Scottish lawyer and traveller after whom a famous papyrus is named, Petrie was insistent from the onset that an accurate record of all finds should be kept, no matter how trivial and unimportant they might appear at the time of their discovery—for who could say that the seemingly insignificant item

located today might not prove to be of the utmost value to the archaeologist of tomorrow?

It was Petrie, too, who demonstrated the importance of stratification and of associated finds, and his arrival in Egypt could not have been more opportune. In the course of a long and memorable career, he evolved the meticulous technique which remains the basis of all sound excavatory work to this day, and with him the era of scientific archaeological investigation may be said to have begun.

Chapter Two

WAYS AND MEANS

TODAY, the sphere of archaeological research is so vast—chronologically it extends back into the past for more than 500,000 years, and geographically covers virtually the whole of the land surface of the earth, not to mention extensive undersea areas in coastal and other waters—that some division of the enterprise in respect both of time and of place is essential.

A much used chronological division was adopted more than a century ago by Christien J. Thomsen, the Curator of the National Museum of Copenhagen, who referred industrial cultures to one or other of three well defined stages, named in accordance with the principal materials employed in the manufacture of implements and weapons—respectively Stone, Bronze and Iron.

As in the case of the distinction made between historic and prehistoric cultures, the transition from the use of stone to the discovery of bronze, and from the utilization of bronze to the smelting of iron, is found to have occurred in various parts of the world at different times. In a particular locality, however, the advance which led to the substitution

of bronze for stone was not infrequently accompanied by the invention of writing, and in practice, archaeological investigation conveniently falls under one of four main geographic-chronological headings—Prehistoric Archaeology (the period covering the evolution of man in the Old World, to the beginning of written records): Oriental Archaeology (the early civilizations of Egypt and Western Asia, from the introduction of writing to Roman times): Classical Archaeology (Greko-Roman affairs, and those of the peoples of other lands bordering the Mediterranean): and American Archaeology (the pre-Columbian cultures of the New World).

Sub-divisions within these four main groupings can, of course, be made as desired, and archaeologists who confine themselves to a particular aspect of their chosen field are distinguished by such self-explanatory designations as Assyriologist, Egyptologist, and Hittologist.

Again, the work has tended to become increasingly specialized in other ways, as more and more reliance has come to be placed upon the technical assistance of such associated sciences as botany, sociology, economics, physics, and chemistry.

Whereas in the early days excavation was often a one-man affair, its director a Jack of all trades in sole charge of a group of native diggers, the complexities of archaeological research today may be judged from the fact that a leader in the field is now liable to find himself surrounded, not merely by a collection of labourers, but also by a host of fellow experts, whose interests may range from

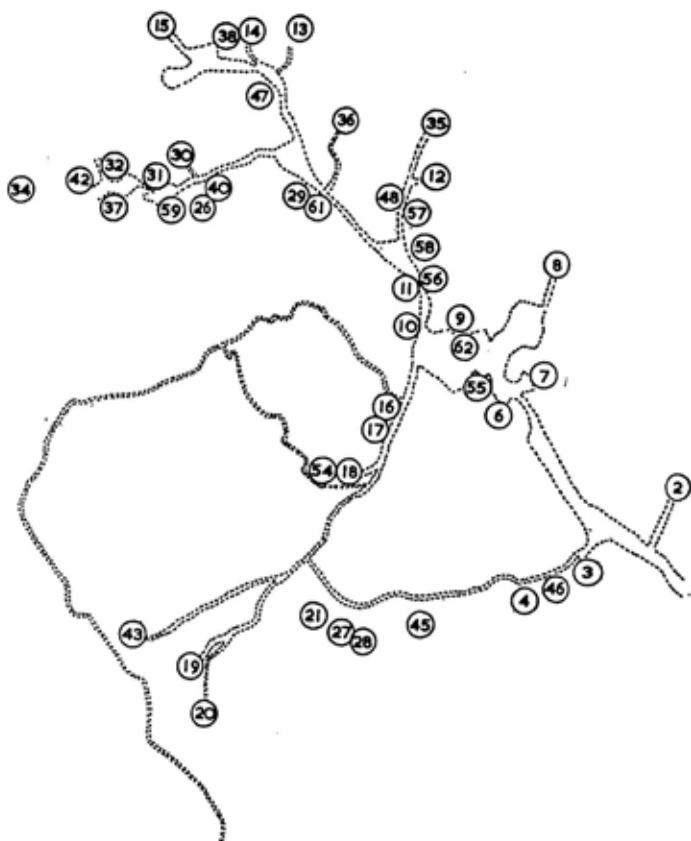
ceramics to architecture and engineering, and from photography to philology and epigraphy. And the costs of excavation, it need hardly be said, have multiplied accordingly.

Inasmuch as the land surface of the earth exceeds 55,000,000 square miles in extent, it may be asked how the archaeologist, with so much territory at his disposal, knows where to insert his spade. A moment's reflection, however, will serve to show that this problem is by no means as formidable as it might at first appear.

For one thing, the area of operations is greatly reduced by geographic and climatic considerations—unfavourable locations such as the tops of snow-covered mountains, or the polar regions, would be far less likely to attract human settlement than would, say, some warm and secluded valley (though regard must, of course, be had for the possibility that the desert of today may have been a fertile region in the past).

Again, an abundant supply of fresh water is one of the vital needs of a settled community of any size, so that the banks of any major river afford a likely location. Account, too, must be taken of the fact that in an area where man has lived continuously for thousands, or even hundreds, of years, some visible evidence of his sojourn there is bound to greet the eye. This is pre-eminently the case in the valley of the Nile, where the crumbling remains of countless stone ruins proclaim the onetime existence of a civilization of no small order.

In Mesopotamia, by contrast, towns and cities, though equally venerable and numerous, were



The Valley of the Tombs of the Kings. The plan gives the location of the main tombs, more than a dozen of which are still unidentified. No. 62 is that belonging to Tutankhamon.

constructed of less durable materials, with the result that the remains of deserted buildings gradually slumped into indeterminate heaps, forming huge mounds of earth, which for centuries attracted little or no attention.

Valuable clues to the whereabouts of a once famous but long vanished city have been provided by aerial photographs, in which soil disturbances invisible at ground level can readily be detected, and also by the accounts of some early Greek or Roman visitor to the place, who happens to describe his route from some recognizable starting point, or mentions the number of days that were required for the journey.

Thus the rock-hewn Nabataean stronghold of Petra, carved out of the middle of a mountain, after having vanished from human ken for centuries, was at last tracked down by J. L. Burckhardt—aided by the writings of Eratosthenes, Pliny, Eusebius, and other ancient chroniclers, who, in describing the lost citadel's many wonders, also suggested that it was to be found somewhere along a line drawn from Babylon to what is now the site of the modern town of Suez.

In a like manner, a chance remark has on occasion led to the finding of some building or other which was greatly renowned in its day, as Mariette's unearthing of the Serapeum at Memphis goes to show.

Again, it may be that a particular region was reserved for structures which served a special purpose, for example, a cemetery. Thus the Valley of the Tombs of the Kings in Egypt was famous

as the burial place of some of the Pharaohs even in Greko-Roman times. Of the once-sealed chambers, cut deep into the rock, some relatively modest in extent, and others presenting a maze of underground passages, with hidden rooms and elaborate precautions designed to preserve their secrets, Diodorus speaks of seventeen, though he adds the interesting information that in an official priestly register, no less than thirty others were recorded, bringing the total in line with the forty open tombs of which Strabo writes.

In modern times, the early investigators could find nothing like this number. Pococke counted up to fourteen: and even Belzoni, after an exhaustive search, brought the figure up to no more than eighteen, and then retired from the scene, expressing himself as satisfied that, thanks to his efforts, no more sepulchres remained to be found.

But Belzoni was wrong, for discoveries continued to be made, until by the beginning of the present century more than fifty royal burial places were known, though all had been despoiled and robbed centuries ago.

A wealthy American, T. M. Davis, then provided funds for the carrying out of a further intensive search in the Valley, with the eminently satisfactory result that half a dozen other tombs were brought to light in quick succession, including those of Tuthmosis IV and Haremhab.

Writing in 1912 of the finding of the rifled grave of the last-named, Davis, like Belzoni before him, expressed the view that the Valley had now given up the last of its secrets. This opinion was echoed by

Gaston Maspero a few years later when, as head of the Service of Antiquities in 1914, he signed the concession enabling Lord Carnarvon and Howard Carter to undertake still further exploration in the much combed Valley.

The work, when it began, was almost immediately interrupted by the outbreak of war, and it was not resumed until 1917. Previous investigators had been content to sink trial holes in likely looking places, in the hope of finding a tomb entrance beneath the layers of rocks and rubble which everywhere abounded.

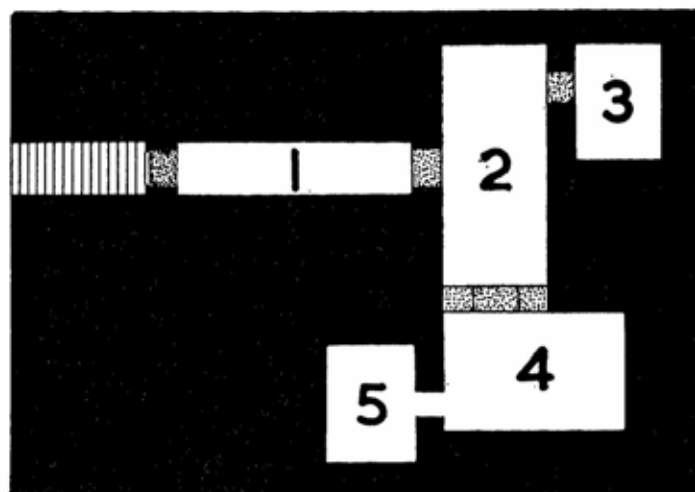
Carter, however, adopted the much more laborious procedure of clearing a selected area down to bedrock, secure in the knowledge that if a tomb did exist there, he would in this way be sure to find it. But after five years of effort, in the course of which thousands of tons of earth had been moved to no avail, funds ran out, and Carter and his patron considered the position.

It was agreed to continue with the work for a sixth and final year, as a result of which crucial decision the first tread of a flight of steps descending into the rock was at last revealed, a stairway which led to the historic discovery of the intact burial chamber containing the mummified remains and the solid gold coffin of the Pharaoh Tutankhamon. . . .

The granting of official government permits apart, work on a newly found and hitherto unexcavated archaeological site can be held up for a variety of reasons, including the sometimes inconvenient fact that the land in question has a private owner who, as likely as not, sees an oppor-

tunity to make a large and unexpected profit.

Henry Schliemann, fresh from his triumphant discovery of the remains of ancient Troy, was prevented from digging among the ruins of Knossus, only because he regarded as exorbitant, and flatly declined to pay, the price demanded of him for the



Plan of the tomb of the Pharaoh Tutankhamon. The entrance steps shown on the left lead to a passage (1); an Antechamber (2); an Annexe to the Antechamber (3); the Burial Chamber (4); and a Store Room or Treasure Chamber (5).

privilege of so doing. In the event, it was the Englishman Arthur Evans who later acquired the site, and with it, as will in due course be recounted, worldwide acclaim as the discoverer of the Minoan civilization which flourished long ago on the island of Crete.

On occasion, the question of land purchase is complicated by the circumstance that there is not one person with whom the archaeologist has to contend, but several. In one memorable instance, a modest Palestinian site of a dozen or so acres was found to have no less than ninety different owners, each one of whom had to be persuaded either to sell or lease his portion of the holding before a start could be made!

But once attention has been given to these and other necessary formalities, including the recruitment of suitable workmen, excavation can begin, though the extent of the work will, of course, depend upon the nature of the undertaking. Where a tomb, palace, or other isolated structure is concerned, the aim will be to carry the task to completion. But where the excavator is confronted by the remains of entire towns and cities, he usually has to be content with less, if only because of the limits imposed by the relative shortness of the span of human life (work at Pompeii, still far from complete, has now been going on, more or less continuously, for about 200 years!).

Again, it may happen that parts of some extensive ruins, such as those of the Assyrian capital of Nineveh, are occupied by a modern village, and so lie beyond the reach of the spade. In all such cases, the archaeologist must, perforce, content himself with a programme of selective digging, after conducting a preliminary survey in the hope of locating some building of importance, *e.g.*, a library. But this failing, he will resort to the opening up of an exploratory trench, say a couple of yards in width

and of any convenient length, marked in squares which will be systematically dug out, ultimately until sterile soil or bedrock is reached.

All excavation, regrettably but unavoidably, is attended by the destruction of evidence which, once it has been lost, can never be recovered, and the importance of the camera in recording the progress of the work will be evident.

The digging will also raise the question of where to dump unwanted rubbish, and care must be taken that it is not inadvertently placed on a site of possible future interest.

As for the condition of any objects which are unearthed, this will depend not only on their nature and age, but also on the state of the soil in which they have lain buried. Usually, it will be found that the presence of moisture, however slight, will have had a most deleterious effect upon wood, cloth, leather, and the like.

Such items as bones and teeth, on the other hand, are often discovered reasonably well preserved. So, too, are many metallic objects, apart from those made of iron, while pottery and flint implements are virtually immune to damp.

A precautionary baking of inscribed clay tablets, and similar emergency measures, are often undertaken in the field, but, whenever circumstances permit, restorative treatment is best carried out in the workroom or the laboratory, where skilled labour and all the necessary equipment and materials are readily available.

The finding of some portion of a building may well lead to the identification of a floor of occupa-

tion, a discovery which will mark a definite stage in the proceedings, for everything found at this level will belong either to the same period as the structure itself, or be of a more recent date—and the question of date is of fundamental importance.

Age assignments are of two kinds—Relative dates (given in terms of some other chronological event), and Absolute dates (expressed in years). An Absolute date, if it can be ascertained, is of course to be preferred—historians like to be able to state that the Great Plague which visited London in 1665 was followed by the Great Fire of 1666. But such precision, though desirable, is by no means essential. What is vital is that there should be a correct ordering of the events, and this the archaeologist is often able to determine from stratigraphical considerations.

Most of the well known cities of the ancients suffered destruction by enemy attack in the course of their long history, many of them not once, but several times. And with each re-building, existing ruins would be levelled, so that eventually the site would come to consist of layer upon layer of man-made debris. Given that these deposits have remained undisturbed, it will be clear that any objects found in a low stratum will be older than those recovered from a high stratum, and that the age of any given layer, moreover, must be less than that of the most recent item found in it.

It was a consideration of these elementary principles which led Flinders Petrie to devise his well-known system of sequence dating, in which a

series of arbitrary numbers (his ranged from 30-80) were used to indicate relative age. Thus an object which, together with any other items associated with it, was assigned the S.D. (sequence-date) 40, would be older than artifacts classed as S.D. 60.

The particular yardstick which Petrie used was ancient pottery ("the archaeologist's alphabet"), a choice dictated by the fact that earthenware has been in use since time immemorial, and that it is sufficiently fragile to ensure that investigators are provided with an abundance of evidence in the shape of broken and discarded pieces.

Much ingenuity has also been displayed in the making of useful, if approximate, estimations of age by other means. How old, for example, is Eridu (the modern Abu Shahren), traditionally regarded as the most ancient of Babylonian cities? An answer to this question emerges from a consideration of the fact that, originally, Eridu is known to have stood on or near the seashore at the head of the Persian Gulf. As a result of the mud-depositing activities of the Tigris and the Euphrates Rivers, however, the town is now located no less than 140 miles inland, and, thanks to an observation made at the time of Alexander the Great, it has been estimated that the silting-up process reclaims about 40 lineal yards of land every year. Assuming a similar rate of deposition in pre-Alexandrine days, Eridu has evidently been in existence for at least 6,000 years.

The absolute dating of events which occurred during the historic period can often be achieved through the records of the country or countries concerned, even though the ancients themselves

failed to devise a chronological scheme based on a fixed era.

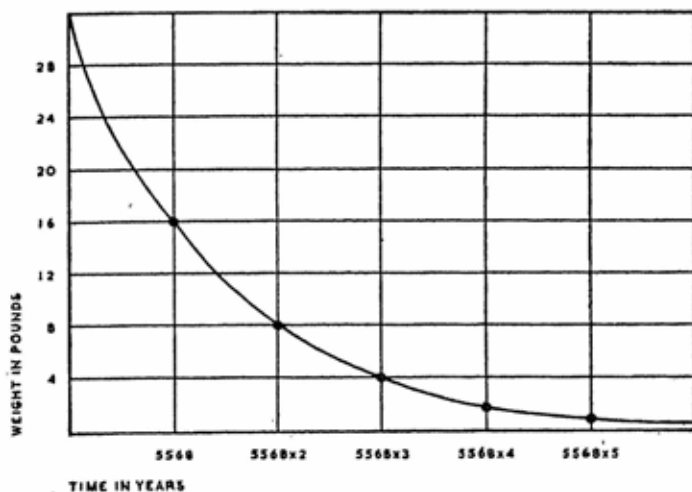
The Assyrians, for instance, adopted the practice of naming each year after some high official, beginning as a rule with the king, and of mentioning in their records any outstanding events which took place during each twelvemonth period. Many of these lists have been recovered, and a reference in one of them to a solar eclipse which had been observed in the month of Sivan (May-June) solved the problem of their dating.

As is well known, the occurrence of eclipses, either in the past or in the future, can be determined with great accuracy by astronomers, and, in the present instance, various considerations (including the all-important question of locality—the phenomenon had, of course, to be visible in Assyria) led this particular event to be identified as a total obscuration of the sun which took place on 15 June, 763 B.C.

On occasion, royal correspondence has also proved to be most informative. Thus, if a copy of a letter is found in which King X writes to King Y, complaining about the behaviour of King Z, we may, or may not, attach much importance to the imputations made (King X, after all, may have been a scoundrel and a liar). What is of interest is the evident fact of the contemporaneity of the three monarchs, for, if we happen to know the date of any one of them, we can be reasonably certain that it can be safely applied to all three.

Recently, an independent method of age determination, based on the phenomenon of radio-

active decay, has been successfully applied to archaeological problems by its deviser, the American physicist W. F. Libby. The use of radioactivity as a dating mechanism rests upon the Rutherford



The fraction of the total number of atoms in a given quantity of radioactive material which breaks down in unit time is constant. The period after which half the atoms have disintegrated is termed the half-life period, and for Carbon-14, this amounts to some 5,568 years, in the course of which thirty-two pounds of the material will become sixteen pounds. After the passing of another such interval, the sixteen pounds will become eight pounds, and so on.

rule that the fraction of the total number of atoms of a substance which breaks down in unit time is constant. In other words, after a given period, both the amount of the active material and the strength of its radiation will have been halved. This period, in the

course of which 32 lb. of matter will be reduced to 16 lb., or 16 lb. to 8 lb., or 8 lb. to 4 lb., is termed the half-life value, and it varies greatly from one radioactive substance to another. Thus metallic uranium has a half-life value of some 4,500,000,000 years, and the end products of its disintegration are helium and lead.

Armed with this information, and with the knowledge that uranium oxide is a constituent of ancient rocks, geologists have been able to estimate the age of these rocks by determining the amount of uranium they now contain, together with the percentage of lead which has resulted from radioactive decay. This has yielded the interesting information that strata relating to the Archaean period are some 2,000,000,000 years old!

The application of this technique to archaeological specimens resulted from a line of reasoning on the part of W. F. Libby which went somewhat as follows: Cosmic radiation from outer space is continuously bombarding the earth's atmosphere, and, in so doing, it transmutes nitrogen atoms into unstable carbon atoms of mass 14. These carbon atoms must inevitably undergo subsequent oxidation, and so form radio active carbon dioxide which, in company with stable, atmospheric supplies of the gas, will be absorbed by plants in the ordinary way.

All plants will thereby become faintly radioactive, and so will the creatures which feed on them. And as even carnivorous animals exist on plant food indirectly through the flesh of their victims, the effect must be that all living things contain appreciable and detectable amounts of carbon 14.

How Libby conducted an instructive experiment, details of which he published in 1947, proving the soundness of his reasoning, need not concern us here. Of greater interest is the fact that the half-life of radiocarbon is 5,568 years, and that if it be assumed, reasonably enough, that the intensity of cosmic ray bombardment has remained more or less constant for a period several times longer than this (for, say, 30,000 years), it may be expected that a state of equilibrium will have established itself between the production of radiocarbon and its decay.

It follows that this state of balance will be faithfully reflected in the amount of radiocarbon assimilated by organisms during their lifetime, in that the amount of new radioactive material which is absorbed will be offset by that which decays. But when death supervenes, the process of disintegration will then go on alone, and its attendant radiation will steadily become weaker and weaker. By measuring the strength of these signals, it should be possible to determine, within the limits of experimental error, how many years ago it was that a particular organism breathed its last.

This theorizing has been fully vindicated by results. The inherent reliability of the procedure was early demonstrated by means of materials of known age, including wood from an Egyptian coffin of the Ptolemaic period, and countless other items of archaeological interest have since been dated by virtue of their radiocarbon content.

Charcoal from the Lascaux Cave, in the Dordogne, for example, gave $15,516 \pm 900$ years: woven rope sandals, from Fort Rock Cave, Oregon,

9,035 \pm 350 years: and corn, found in basket-lined granaries in the sands of Egypt, 6,315 \pm 427 years.

At present, the range of satisfactory measurement is about 30,000 years, beyond which the signals become too weak. Even so, the archaeologist now has at his disposal a novel and revolutionary technique which, subject to a definable margin of error, promises to provide him with a means of establishing an absolute chronology far beyond the limits of the historic period.

Chapter Three

PROBLEMS OF DECIPHERMENT

IN the course of man's early attempts to represent speech in the absence of a speaker, crude pictures were used to denote actual objects—an eye was an eye, a dog was a dog, and a circle was the sun.

But in time, these pictographs, as they are called, developed into ideographs or word signs, in that they came gradually to represent, not so much the objects themselves as the ideas associated with them—an eye with seeing, a dog with hunting, and a circle with daytime or warmth.

Then followed the introduction of phonetic elements, of symbols which stood, not for things, but for *sounds*. This was a great step forward, for it made possible the representation of abstract ideas—a drawing of a bee, for example, when shown in conjunction with an outline of a leaf, could be used to express the notion of "belief".

Also advantageous was the fact that the innovation made possible a very considerable reduction in the number of symbols required. Whereas picture writing might call for the use of thousands of different drawings, each of which had to be memorized,

the conversion, first to syllabic, and eventually to alphabetic, scripts brought down the number of signs or letters to between twenty and thirty.

During the past five or six thousand years, many changes have taken place both in the way in which speech has been committed to writing, and also in the underlying languages themselves—compare the English of today with that of Chaucer's time, less than 600 years ago.

Moreover, in addition to undergoing a slow evolutionary process which may ultimately alter them out of all recognition, languages not infrequently become defunct as the result of some war of conquest which imposes upon the vanquished the alien tongue of the victor.

Four possibilities thus face the would-be interpreter of an ancient inscription, depending upon whether the language and the writing are known or unknown. If both turn out to be familiar, there is, of course, no problem. If it is the writing, but not the language, which is unknown, decipherment may be expected to be relatively easy. Finding a solution becomes much more difficult, however, when it is the language, not the writing, which is unknown, and virtually impossible in cases where neither can be recognized.

It has been said that when the writing, but not the language, is known, decipherment is likely to be relatively easy. Here, the operative word is "relatively", for at the onset of the enquiry, the investigator may have no way of knowing that the language which is concealed by the unfamiliar script *is* known. In such circumstances, regard will

be paid to the history of the country concerned, it being borne in mind that the ancients often carried off the monuments of their defeated enemies as spoils of war. But even if it can be established that the find is a local product, it may well turn out that the language spoken in the land today is not the one that is sought.

This was the situation which faced the scholars who, from the middle of the sixteenth century onwards, interested themselves in the problem presented by the Egyptian hieroglyphs. At that time, the peoples of Egypt no longer spoke Egyptian, for, thanks to the Moslem invasion of their country 900 years earlier, their speech had long been Arabic. What, then, *had* been the language of the ancient Egyptians?

The answer to this all-important question was supplied, at any rate in part, by the researches of Athanasius Kircher. In 1626 he published the result of his investigations, which led him to the conclusion that the language expressed by the hieroglyphs must be Coptic, for the modern Copts then living in the land of the Nile, as the descendants of those Christianized Egyptians of Roman times who had stubbornly refused to embrace the Islamic faith after the arrival of the Arabs, must surely have preserved some semblance of their native tongue.

























The situation was complicated, however, by the fact that the then near-defunct Coptic language was written, not in hieroglyphic, but in Greek characters—the result of the earlier subjugation of Egypt by Alexander the Great. And as if all this were not enough, no less than three apparently distinct kinds

of ancient Egyptian writing were known—the pictorial hieroglyphs (usually to be encountered on the walls of temples and monuments): the cursive hieratic script (long used by the priests for their hand-written documents): and the even more abbreviated demotic (a much later development, employed for everyday and business affairs.)

Kircher's attempts to ascertain the meaning of the hieroglyphs, as is now realised, were a ludicrous failure, for among other things he was obsessed by the idea that the inscriptions on the monuments were of a purely sacred or mystical character. Nor, during the next century and a half, was much progress made by other scholars, many of whom mistakenly believed that the picture symbols were exclusively representative of things, not of sounds.

It was noticed, however, that the inscriptions contained many groups of signs which were distinguished by an encircling oval ring, or cartouche, and several investigators put forward the suggestion that these rings were intended to draw attention to items of special significance, such as the name of a king. This reasoning, as will be seen, was soundly based.

An event which was to prove of decisive importance then occurred. In 1798, Napoleon had begun his ill-fated invasion of Egypt, and in August of the following year, some French soldiers engaged in digging fortifications near the Rosetta (western) mouth of the Nile, unearthed a slab of stone, upon one face of which were inscribed three different kinds of writing. Two of the scripts proved on investigation to be hieroglyphic and demotic res-

 W	 AYIN	 Y	 ALEPH
 M	 F	 P	 B
 H	 H	 R	 N
 S	 S	 H	 H
 G	 K	 Q	 S
 Z	 D	 I	 T

Egyptian uniconsonantal signs. Note that, apart from the weak consonants *w* and *y*, vowels are not represented. Certain of the symbols express sounds which can be reproduced alphabetically only by using combinations of two or more letters (*kh*, *sh*, *tsh*), while other of the signs (*aleph* and *ayin*) are without English equivalents.

pectively, *i.e.*, ancient Egyptian. But the third version was in Greek!

It was at once realized that the Rosetta Stone, as it came to be called, was almost certainly a bilingual, and that what the Greek section had to say was in all probability repeated in the accompanying Egyptian accounts. This assumption was confirmed when the Greek writing was translated, for it proved to be a priestly edict, issued at Memphis in 196 B.C., concerning the then reigning monarch, Ptolemy V Epiphanes. And among other things, it had been decreed that the proclamation was to be issued in Greek, in the "writing of the books" (demotic), and in the "writing of the speech of the god" (hieroglyphic).

There was great excitement among scholars at this discovery, for in the Rosetta Stone, it seemed, there had at last been found the long awaited key which would unlock the door to the secret of the mysterious hieroglyphs. But these hopes gradually faded as one leading philologist after another had to confess himself baffled.

At this time, the nature of the Egyptian writing was still far from being understood; some investigators maintained that it was purely symbolical; others held that it was exclusively phonetic. In fact, it was a combination of the two. Nor was it appreciated that the wording of each of the three versions, though essentially the same, was by no means identical. Again, the enquiry was hindered by the fact that the Stone was badly damaged, and that it was difficult accurately to compare the contents of the known and unknown sections.

Nevertheless, from the relative positions occupied by various groups of signs in the hieroglyphic and demotic portions (due allowance having been made for the fact that the Egyptian writing was known to read from right to left), it was possible to identify several proper names with reasonable certainty, among them that of King Ptolemy.

This was the situation when the noted Cambridge scholar Thomas Young became interested in the problem in 1814, and in the course of the next few years he was able to establish that the several forms of Egyptian writing were closely related to one another, in that the hieratic script was merely a cursive form of the original hieroglyphs, and that the demotic writing was more abbreviated still—a kind of shorthand, as it were.

Young also pointed out that hieroglyphic characters possessed of fronts and backs almost invariably faced in the direction in which the writing was intended to be read, and confirmed that the cartouches did in fact contain royal names.

He also reached the important conclusion that native scribes, if called upon to write the unfamiliar name of some foreign conqueror, would do so by resorting to the *sound* values of existing signs, without regard to any symbolical meaning which might normally attach to them. But when he then essayed to equate the name Ptolemy, the Greek form of which was Ptolemaios, with its supposed hieroglyphic equivalent, he at once encountered the difficulty that, whereas in the royal oval there were seven signs, the Greek spelling provided him with an excess of letters, which he tentatively allocated thus :



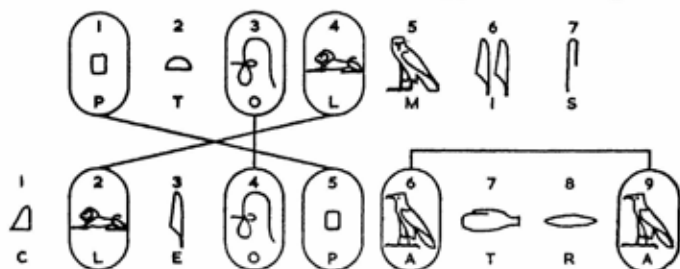
Young, however, was in error in disregarding the 3rd hieroglyph as inessential, and he also failed to take into account the fact that the ancient Egyptians did not normally express vowels in their writing. As it happened, each of the seven signs in the cartouche was representative of a single Greek letter, giving P T O L M I S—*i.e.*, P T O L (E) M (A) I (O) S, minus the three vowels shown in parenthesis.

As a result, when Young attempted to apply his tentative sign values to other royal names, his initial mistakes inevitably led him still further into error, and in the end he gave up, convinced that he was on the right track, but unable to determine precisely where he had gone wrong.

Within a short time, the answer was provided by a young French student of the hieroglyphs, by name Jean Francois Champollion. For some years, Champollion had also failed to make much headway, though for a different reason. Like many of his contemporaries, he had long subscribed to the idea that the ancient Egyptian writing was devoid of phonetic elements. But in 1822 he suddenly abandoned this view, and turned instead to the possibility that the hieroglyphs might possess sound values, as Young had supposed.

As a result, he was at once able to read the seven signs representative of Ptolemy as P T O L M I S,

after which he contrived to confirm the correctness of this rendering by cross checking it with the contents of another cartouche, which he had good reason to believe referred to Queen Cleopatra:



As will at once be seen, the 1st, 3rd, and 4th signs of Ptolemy duly appear in their proper places (5th, 4th, 2nd) in the name Cleopatra. Added proof was provided by the fact that the first A of the Queen's name (6th sign) was repeated where the second A occurred (9th sign). And although the T of Ptolemy (2nd sign) was not in agreement with the T of Cleopatra (7th sign), Champollion explained this as a case of homophony, as an example, that is to say, of one character having the same sound value as another (compare the use of the letters *c* and *s* in such English words as *cite* and *site*).

Thus armed with the phonetic values of a dozen of the hieroglyphs, Champollion immediately applied this knowledge to the contents of dozens of other cartouches. The first of these contained nine signs, six of which were now known to him, giving A L? S E? T R?, a name which could only be that of Alexander. The Greek form was Alksentrs, and three more values were added to his list.

Champollion published the result of his findings in 1824, by which time he was able to show that the Egyptian writing was a highly complex system which was at once "figurative, symbolical, and phonetic in the same text, in the same phrase, in the same word". But much, of course, yet remained to be done, and although the discoverer, worn out by excessive work on the problem, collapsed and died a few years later, all three Egyptian scripts can now be read and understood without difficulty, thanks to the patient labours of those who followed.

Other scholars, meanwhile, had long been trying to make some sense out of an unusual wedge-shaped writing, to which the name cuneiform (Latin, *cuneus*, "wedge") had been given. This strange script was first brought to European notice by visitors to parts of the old Persian Empire, and several of these travellers, in particular Carsten Niebuhr, made copies of some of the inscriptions which were to be seen carved on the face of rock and other monuments.

It was Niebuhr who drew attention to the fact that the writing was almost invariably to be found in triple columns, and that it appeared to be of three different kinds. One of the three versions consisted of about 40 different signs, another of 100 or so, and the third of several times this number. It thus seemed reasonable to assume that three different writings, and perhaps as many different tongues, were concerned. But if the inscriptions were trilingual who were the authors, and what could the three languages be?

As in the case of the Egyptian hieroglyphs, the

position was complicated by the fact that after the collapse of the Persian Empire, its peoples had also known a succession of conquerors, among them Greeks (the Seleucids), Parthians (the Arsacids named after Arsaces I) and Arabs, and, as in Egypt, the last named had imposed their own mode of speech and writing upon the inhabitants.

In the light of what was known of the history of the region, a number of investigators reached the conclusion that the inscriptions belonged to the Parthian period, so that if (as was to be expected) the monarchs of that time found mention therein, the royal names to seek would be those of the Arsacids.

Other scholars, however, favoured an earlier authorship, and ascribed the writing to the Achæmenian kings, to the rulers, that is to say, of the Persian Empire at the height of its power, and before its defeat at the hands of Alexander the Great.

This view (which had the merit that it happened to be the right one) was adopted by G. F. Grotefend, at the time a 27-year-old Göttingen schoolmaster, who is said to have become interested in the problem of cuneiform decipherment as the result of a wager. Understandably enough, he gave his attention to the least complicated of the three scripts—to the one which, because of the small number of signs it contained, was generally thought to be alphabetic. It also possessed the advantage, recognized by an earlier investigator, that a particular mark, often repeated, functioned as a word divider, so that what would otherwise have been a confusing jumble of signs was separated into well-defined sign groups.

Grotefend had before him copies of the inscriptions earlier published by Niebuhr, and, while comparing two of them which were of moderate length, he made an interesting discovery: with the exception of one or two words, the two inscriptions appeared to be identical. After pondering the matter, Grotefend concluded that the inscriptions were probably a standard proclamation which had been issued by two different monarchs, *each of whom had identified himself by name in that part where the difference in wording occurred.*

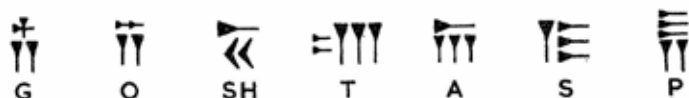
Then came another significant observation. One of the supposed names (call it X), which appeared in the first line of one inscription, was repeated in the third line of the other, while both it and another name (say Y), which found mention in the first line of the second inscription, differed from a third name (Z) which occurred in the fourth line of the first inscription;

	Inscription	
	1st	2nd
First line	X	Y
Third line		X
Fourth line	Z	

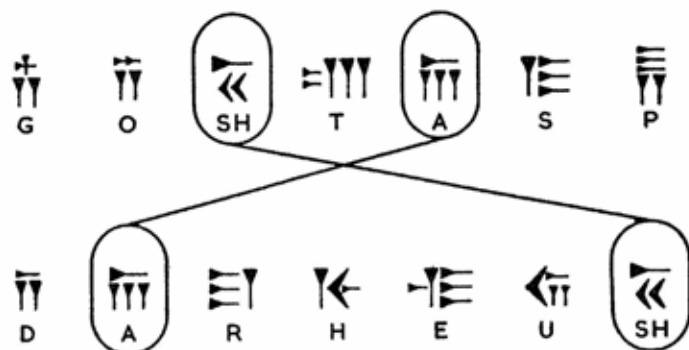
What was the significance of this? To Grotefend, only one explanation seemed possible: in their respective announcements, each of the two monarchs had referred not only to himself, but also to his father (King X, son of Z; King Y, son of X) and that consequently, the two rulers must be related: *that they must, in fact, be father and son.* The problem of identity was thus reduced to the finding

of three members of the royal house of Achaemenes who fitted the kinship requirements, and, as it happened, there was but one answer: Darius, who was the son of Hytaspes; and Xerxes, who was the son of Darius.

These names, however, were in their Greek form, and there remained the problem of ascertaining their Persian equivalent. There was some evidence to suggest that the owner of the name Hytaspes had rendered it Goshtasp, and, using this information as his starting point, Grotefend applied it to what he believed to be the appropriate sign group:



His next step was to check the results so obtained, using the symbols which he supposed might refer to Darius, the Persian form of which emerged as Darheush:



The correct spellings are now known to be Vish-taspa and Daryavush respectively, but the extent of the error was fortunately such that it did not effect the values SH and A which the two names happened to have in common, and although much remained to be done, by the middle of the 19th century the ingenious Grotefend and those who followed him (outstanding among whom was the Englishman Henry Rawlinson) had completely deciphered the writing in the first of the triple columns.

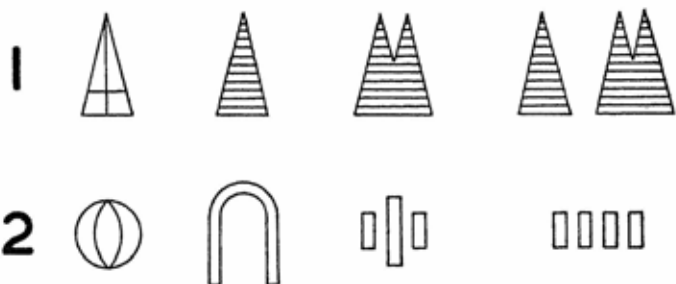
As for the remaining versions, one of these proved to be written in the language of the Elamites (a people who lived in the highlands bordering Mesopotamia), while the other was shown to be Babylonian. It thus appeared that just as French, German, and Italian are all spoken in various parts of Switzerland, so in the Persian Empire three official languages were recognised—Old Persian (as it is now termed), Elamite (earlier known as Susian, after Susa, the capital of the kingdom of Elam), and Accadian (the modern name for Babylonian).

Of particular importance to scholars was the knowledge of Accadian which was gained from the Persian inscriptions, for it made possible the decipherment of the hundreds of unilingual baked clay tablets which at the time were being unearthed in ever-increasing numbers in Mesopotamia.

The Elamites and the Persians were not alone in making use of the Babylonian system of writing, while yet other peoples adopted that of the Egyptians, the borrowed script in each case being adapted to suit the needs of the native tongue. The Hittites

of Asia Minor actually made use of both forms, employing a distinctive hieroglyphic writing for monumental purposes, and a cuneiform script for everyday needs. Decipherment was for many years delayed by seemingly intractable difficulties (the underlying language, or rather languages, were unknown) but recently it has been attended by considerable success.

By contrast, examples of a hitherto unknown



Hittite hieroglyphs—ideograms (1) and phonograms (2). Inscriptions proceed in boustrophedon (ploughwise) fashion, the lines of writing running alternately from right-to-left, and from left-to-right.

cuneiform writing, found by C. H. A. Schaeffer among the ruins of the long lost Phoenician city of Ugarit (Ras Shamra) in 1929, gave little trouble. Decipherment was achieved almost simultaneously by a trio of scholars, working more or less independently, in a matter of months, a feat made possible by the phonetic nature of the script, and by the correctness of the assumption that the language concerned could not be other than Semitic.

Still more recent has been the accomplishment of

the late Michael Ventris, an architect by profession and a philologist in his spare time, who solved the riddle of the Linear B script, first discovered on the island of Crete at the beginning of the present century. Neither the writing nor the language was known, and the problem had baffled scholars for more than fifty years. Yet, by dint of assigning likely syllabic values to certain of the signs, and by assuming that others were simple vowels, Ventris eventually obtained the names of five of the leading towns of Crete, and was then able to show that the sign values thus determined, when applied to other groups of characters, produced recognizable words in an archaic form of Greek!

As for the problems of decipherment which still await a solution, not to mention a Grotefend, a Champollion, or a Ventris, there may be mentioned that presented by the language of the Etruscans (it has defied a succession of scholars for some 2,000 years!); the mysterious *rongo-rongo* script of Easter Island; the inscriptions found on Enkomi, in Cyprus; a collection of three hundred or more characters inscribed on seal stones recovered from the ruined sites of Harappa and Mohenjodaro, in the Indus Valley; a Proto-Elamite writing which long antedates that found on the Persian monuments; and the Mayan glyphs, knowledge of which was lost to the world as a result of the Spanish descent upon the Americas at the beginning of the 16th century, and no more than a limited understanding of which has since been regained.



Undeciphered languages and writings—(1), part of an Etruscan inscription; (2), the Easter Island *rongorongo* script; (3), Cypro-Minoan characters; (4), unknown script from Harappa and Mohenjodaro, in the Indus Valley; and (5), Proto-Elamite signs.

Chapter Four

THE PREHISTORIC PERIOD

IT is now believed that the earth came into being some 3,000 million years ago, and that at the time of its formation its substance was either gaseous or liquid, and far too hot to support life as we know it. But as its surface slowly cooled, a solid crust formed, water vapours condensed, and oceans appeared. And it was in the warm waters of these primordial seas, there is reason to suppose, that dissolved nitrogenous compounds interacted to produce a series of complex amino-acids, which in turn gave rise to living matter.

However this may be, terrestrial life undoubtedly had its beginnings in the sea. Moreover, that the process of vitalization must have occurred relatively late is indicated by the fact that the oldest rocks, those of the Archaean period, show no trace of it. Among the limestones of the succeeding Proterozoic period, however, which were laid down during the next 1,000 million years or so, there are signs that the first living matter had by then appeared, while fossils associated with subsequent geological strata—the Palaeozoic, the Mesozoic, the Tertiary (with its subsidiary Eocene, Oligocene,

Miocene, and Pliocene systems), and the Quaternary—provide convincing evidence of a progressive evolution, in the course of which life adapted itself to the land, and even took to the air.

The eventual emergence of man is generally held to have taken place in Quaternary times, during the last and shortest of the geological epochs. Little or nothing is known concerning the time and place of this momentous event, apart from the fact of its having happened. But it has been satisfactorily demonstrated, by means of what is known as the precipitin test, that man's nearest living relatives are the higher apes, though in all probability the ancestors of the anthropoids and the ancestor of man began to diverge from one another millions of years before the first human being appeared in Asia, Africa, or Europe, as the case may be. It seems likely, too, that for untold centuries after his appearance, man left no record of his presence on earth other than a palaeontological one: his bones.

Not a few fossilised skulls have been found which are held to be intermediate between the anthropoids and *Homo sapiens*, among them that of *Pithecanthropus*, the Java ape-man, while human remains of great antiquity have been unearthed in many parts of the Old World. A new human fragment of unusual interest was found by J. T. Robinson in 1953 at Swartkrans, in the Transvaal, at an Upper Pliocene site, rich in fossilized remains, which the author visited in the company of the discoverer some years ago. The new find is characterised by a nose which is set on the face in human fashion, while a deep palate and the smallness of the canine

teeth suggest that the remains may well belong to the oldest euhominid (true man) yet found.

In the past, however, the study of such anthropological evidence has not been without its surprises, as is shown by the case of the Piltdown Man. These remains, consisting of pieces of a lower jaw, and of more than one skull, were discovered about fifty years ago by Charles Dawson, while he was searching among ancient hill-top gravels in Sussex. Called *Eoanthropus dawsonii* (Dawson's Dawn Man), the find achieved world renown as possessing the combined attributes of man (the skull) and monkey (the jaw). This unprecedented association of relatively advanced skull and primitive jaw gave rise to much learned theorizing, and led to such attempted reconciliations as the hypothesis of asymmetrical evolution, which sought to account for what was otherwise to be regarded as an inexplicable phenomenon by supposing that one part of the animal body was susceptible to a much faster rate of evolution than another. But this and other laboured explanations failed to satisfy an ever-increasing number of experts, particularly those of American nationality, whose patriotic feelings were not involved, and who freely expressed the ungentlemanly view that the skull and jaw did not belong.

The resulting conflict of opinion was not finally resolved until 1952, when in a special *Bulletin* issued in November of that year, the British Museum admitted that the credentials of the supposed "first Englishman" had been carefully re-examined, and had been found sadly wanting. The age of the skull

portion, it now appeared, was nearer 50,000 than 500,000 years (as had been claimed), while the much debated lower jaw had unquestionably come from a modern ape! Apparently an anonymous practical joker had gone to considerable pains to give the mandible an appearance of great antiquity, and had then placed it with the skull fragments in a spot where discovery was only a question of time!

This is by no means the first hoax of its kind perpetrated upon unsuspecting excavators, and no doubt it will not be the last. But henceforth, the experts will be less easily fooled, thanks to the modern techniques which science has placed at their disposal. Thus the true worth of the Piltdown specimen was revealed by a chemical test which makes use of the fact that, by a process of ionic exchange, the element fluorine, which is normally present in soil, is slowly taken up by bone tissue to form a stable compound called fluorapatite (calcium fluophosphate). The amount of fluorine which is absorbed in this way increases with geological age, and it can be measured.

Account, however, has to be taken of the fact that the *rate* of absorption is governed by the fluorine content of the soil, and as this varies widely from one locality to another, a useful comparison of the relative antiquity of fossilised bones from *different* deposits cannot be made. On the other hand, the test provides an infallible indication of any difference in the age of bone fragments which happen to be found together—as the sensational result noted above goes to show.

Strictly, the study of skeletal remains is the

province of the palaeontologist, and as all animals, including the near relatives of man, leave their bones behind them when they die, it is not surprising that on occasion there should be some difficulty in deciding whether a particular specimen is to be attributed to a man-like ape, or to an ape-like man.

On the other hand, there can be no doubt whatever about the ownership of an implement fashioned out of stone, and it is with such unmistakable evidence of purposeful activity that the archaeologist is primarily concerned. For him, that is to say, the essence of the distinction between man and his anthropoidal ancestors is the ability of *Homo sapiens* to adapt materials for his own use.

The earliest signs of cultural activity of which there is certain evidence appear during the Pleistocene, or Ice Age, days of the Quaternary epoch. But unlike the comparatively well defined periods of the geologist, archaeological divisions are indicative of the conditions of a people rather than an absolute measurement of time. This is so because the successive use of stone, bronze, and iron implements did not take place simultaneously throughout the world, or indeed in all parts of the world, nor has the period of use been of equal duration in different areas. Even so, the sequence which Thomsen enumerated has useful general applications, and the Stone Age, in any case, accounts for more than nine-tenths of man's life on earth.

This vast period of time is conveniently studied under three broad headings—Palaeolithic (Old Stone); Mesolithic (Middle Stone); and Neolithic

(New Stone)—of which the first is applied to the earliest stage of human culture. Various subdivisions have been introduced (Lower and Upper Palaeolithic), and also included is a Pre-Palaeolithic, which some scholars recognize on the evidence of what are held to be flint and stone implements belonging to Tertiary times. The difficulty about deciding this issue, over which there has been much argument, is that considerable uncertainty exists as to whether the alleged tools are in fact man-made, or whether they are merely flakes of rock which owe their formation to denudation and other natural processes.

But it is perhaps not unreasonable to assume that the manufactural skills exhibited by Palaeolithic man presuppose an earlier and less advanced stage, and the term Eolithic (Dawn Stone) has been applied to it.

Understandably enough, our knowledge of our Palaeolithic forebears is exceedingly scanty, for it is based almost entirely upon a study of implements and bones (both animal and human) discovered in caves and open sites. From this evidence, such as it is, it has been inferred that use was made of fire, and that crude huts as well as caves served as shelters. Agriculture was unknown, but both vegetables and animals were eaten, the hunt presumably providing skins for clothing as well as meat for food.

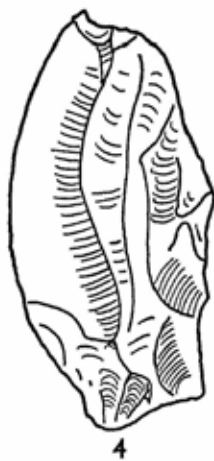
The stone tools have afforded information, not only about the capabilities of those who fashioned them, but also about the movements of peoples. The implements, of several kinds, are variously distinguished as Pebble Industries (rough, chopper-like

tools, made by striking flakes off pebbles, so as to produce a working edge); Core Industries (in which a superior working edge was formed by removing flakes from both faces of a piece of rock); and Flake Industries (in which it was the flakes, not the core of rock from which they were struck, which were utilized).

There were thus produced scraping instruments, boring devices, and pear-shaped implements which have been called hand-axes (French, *coup de poing*). Doubt exists, however, as to whether these so-called axes were held directly in the hand, or were mounted on a stick, and in view of this uncertainty, some authorities prefer to refer to them merely as bi-faces.

Several distinct manufacturing techniques have been observed among the products of these industries, and a number of associated chronological divisions recognized. These divisions are usually known by the place name of the site where the arch-type of a particular example was discovered. Thus a well made bi-face of characteristic workmanship, which was first noted in the vicinity of St. Acheul, France, is known as Acheulean, as are all implements of the same kind, irrespective of where they are now found.

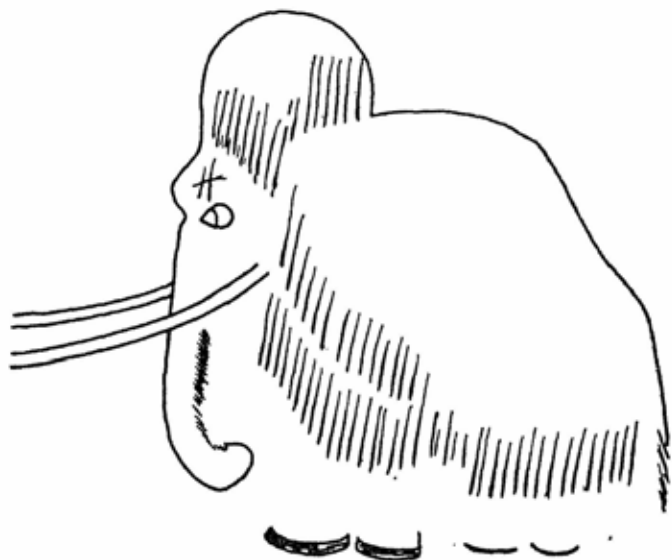
As for the question of distribution, examples of some of these highly distinctive tools, though unearthed in widely separated areas, have been so similar in design and workmanship that the conclusion appears inescapable that the knowledge of how to make and fashion them must have spread from some original centre of manufacture. A study



Stone Age implements—(1), Chellean scraper; (2), Aurignacian blade; (3), Chellean hand axe; and (4), Acheulean hand axe.

of all the find-spots of a given type of implement thus provides information about culture diffusion and, it may be, about the movements of its makers.

In Europe, the end of the Palaeolithic period was heralded by profound climatic changes which accompanied the termination of the Pleistocene or



The mammoth, as seen by Magdalenian man—an engraving found on the wall of a cave at Font-de-Gaume, France.

Ice Age, and by the introduction of much improved flint industries (termed Aurignacian, Solutrean, and Magdalenian) which in turn led to the development and use of such specific hunting weapons as the spear, the harpoon, and the bow and arrow.

Bodily ornaments, too, began to be worn by

mankind, in the guise of necklaces and bracelets made of perforated sea shells, while the walls of ceilings and caves were decorated with animal paintings and engravings by their artistically-minded owners.

The stage was thus set for the entrance of modern man, the first representative of whom appeared on the scene some 10,000 years ago (*c.* 8000 B.C.). Archaeologically, the event may be assigned to the Mesolithic period, which among other things witnessed the domestication of the dog and the use of boats for fishing, this last an indication of one of a number of marked changes in food economy occasioned by the retreat of the ice and the arrival of present-day fauna.

Stone implements, still everywhere in use, continued to be manufactured much as before, though they began to assume increasingly small forms until, after the passing of several thousand years, Mesolithic cultures were gradually replaced, first in one region, and then in another, by the agricultural economy of the Neolithic Age.

The New Stone Age was marked by the invention of farming—by such activities as the growing of crops and the domestication of animals for food (notably pigs, sheep, and oxen). As a result, man's nomadic existence tended to come to an end, and he began to develop a social organization appropriate to a settled way of life.

Other revolutionary innovations of the time were the introduction of such handicrafts as weaving and pottery making, while the inevitable working of flint and stone was characterized by a polishing

(as opposed to the earlier flaking) technique—hence the name *New Stone Age*.

There is some evidence to suggest that these far-reaching advances may have originated in Western Asia, and that from there they spread to other parts of the continent, and thence to Africa and eventually to Europe. At all events, it is in Mesopotamia and the neighbouring lands of Syria, Palestine, and Egypt that the earliest known Neolithic remains have been found, and there seems to be no doubt that their European equivalent is considerably more recent in date.

Intermediate between the Ages of Stone and Bronze, some scholars recognise a Sub-neolithic or Chalcolithic (Copper-Bronze) Age, in which copper, newly found and beginning to be used, had yet to replace stone as the principal material for tools and weapons. In common with gold and silver, copper occurs native, and no doubt much Neolithic head-scratching was occasioned by early attempts to extract and use it. But the metal is also to be found in combination with other elements in the form of ores (mainly oxides and sulphides), and it may well be that a hot fire, built within a circle of mineral-bearing stones, resulted in a lump of crude copper being found when the ashes were raked.

It is a curious fact, however, that although dozens of metals are now readily available in a highly refined state, in a pure form they are but little used. The explanation is that metals usually exhibit far more useful properties when two or more of them are mixed together in various proportions to form alloys—a chance discovery which was made, per-

haps, by the accidental heating of a mixture of tin and copper ores. The outcome must have perplexed those concerned not a little, for whereas both copper and tin are relatively soft and weak metals, in company with one another they produce that tough and tenacious material known as bronze.

As for the Age of Iron, the utilisation (as distinct from the treasuring of meteoric samples) of this wonder metal was dependent upon the discovery of how to smelt it, a complicated operation which calls for a reducing atmosphere and a temperature of a high order.

The first production of iron on what may be termed a commercial scale is usually attributed to the Hittites of the fourteenth century B.C., whence the secret of its manufacture eventually spread to Europe by way of the Philistines (erstwhile Cretans) and the Greeks. Thanks to the difficulties which attended the making of the metal, however, it long remained scarce and highly prized, so much so that in the England of Edward III (A.D. 1327-1377), some iron kitchen utensils are said to have been classed among the jewels!

The importance of the prehistoric period lies not only in its vast length, but also in the fact that during it, man made virtually all the basic discoveries which led to his advancement, and which continue to govern many aspects of his existence to this day. The development of speech, for example, was an event of the utmost significance for the future of mankind. Other creatures, it is true, contrive to make known their feelings and intentions towards one another in various ways, including the

making of sounds which range from grunts and growls to cackles and screeches. It has been claimed, indeed, that the oral exchanges of the anthropoids constitute a primitive form of speech, and a Japanese professor has recently described how, after familiarizing himself with the talk of Asian monkeys, he visited some of their African cousins, only to find to his chagrin that they spoke a different language! The general consensus of authoritative opinion, however, is that, in the absence of a vocabulary, even the most learned of the apes must be considered incapable of discourse, and that, of all the animals, man alone can claim to be a conversationalist, at any rate as yet.

The question of when, where, and how man taught himself to speak is unanswered, and it is likely to remain so. But whereas the ancients were content to regard speech as a gift from the gods, modern philologists, in search of a more scientific explanation, have variously suggested that man's first meaningful words were uttered instinctively (the so-called *Pooh-pooh* theory), or involuntarily (the *Yo-ho-ho* theory), or by way of imitation (the *Bow-wow* theory).

It may well be that human speech did not fully develop until men began to live in communities, and so experienced a need to indulge in an exchange of ideas, though whether this development was confined to one particular place, or occurred independently in a number of widely separated regions, it has not been possible to determine.

Certain it is that there are several thousand different languages in use throughout the world

today, though examination has shown that many of them are closely related to one another, in that they share a common ancestor. Thus French, Portugese, Spanish, Italian, and English can all be traced back to Latin, the language of ancient Rome, so that the possibility exists, as some philologists maintain, that all languages have been derived from one language, first spoken anything up to half a million years ago.

Unlike language, writing is a comparatively recent innovation, and the earliest known records



African bushman painting, depicting a fishing expedition.

go back for a mere 6,000 years or so. Ironically enough, no reliable account of how writing came to be invented has come down to us, though there is good reason to suppose that the many different scripts in use throughout the world today all developed from the drawings which Neolithic man scratched and painted on the walls of his caves. In time, no doubt, these outlines were grouped so as to provide a graphic description of hunting scenes and the like, until often recurring figures ultimately acquired accepted meanings. Thereafter, their use-

fulness for purposes of record having been realised, the signs were transferred to a medium which permitted easy handling, and which could be safely stored when not required.

Two such substances were early employed—papyrus and clay. Papyrus (the forerunner of paper) is obtained from an aquatic plant which was once abundant in the lower reaches of the Nile, and the discovery that a thin vegetable membrane made an excellent writing surface led to the use of the plant for this purpose. Its soaked fibres were laid horizontally, and another layer placed vertically on top of them, an adhesive being used to bind them together. Pressure was then applied, and, after being subjected to drying and polishing processes, the material was ready for use, in the form of rolls of up to 120 feet in length. A reed pen, and an ink made of lampblack, were other essential items of the scribe's equipment.

As for clay, of which there was an abundance in Mesopotamia, this was used in the form of tablets, often small and cushion-shaped, upon whose surface the distinctive, wedge-like characters earlier described were indented by means of a reed stylus. The tablets were then baked hard.

Chapter Five

PEOPLES OF THE NILE

THE story of Egypt is essentially the story of the Nile, a river which seemingly came into existence during the Pliocene period, when lake waters in the highlands of Central Africa overflowed their banks and cascaded down the mountainside to the plains below. Here, the escaping torrent was joined by other streams, and thus augmented, continued to flow onwards and northwards across thousands of miles of intervening desert, until at last the sea was reached by way of an ancient marine gulf which extended far inland from the confines of the Mediterranean basin. Thereafter, the newly formed waterway gradually carved a channel for itself in the rocky plateau over which it passed, leaving high cliffs, in places a dozen or so miles apart, on either side.

In some such spectacular fashion, not only did abundant supplies of water reach an arid and desolate waste, but much rich soil was brought down with them, and deposited along the river bed. Large quantities of this sediment were also carried down to the river mouth, with the result that the ancient marine gulf eventually became silted up, forming a

fan-shaped area of land across which a divided Nile made its way by half a dozen branches to the sea.

What was destined to become the kingdom of Egypt thus emerged as two distinct but adjoining regions, the one a narrow, 500-mile long water-worn rift, hemmed in on either side by towering cliffs (the Valley), and the other a low-lying, triangular-shaped expanse of marshland, more than 8,000 square miles in extent (the Delta, so-called by the Greeks, because of the likeness it bore to Δ , the fourth letter of their alphabet).

Each summer, thanks to a phenomenon known as the inundation, the waters of the Nile rose 20 feet or more (40 feet in the upper gorges) above their usual level, flooding large tracts of the Valley floor, and leaving behind as they receded a fresh layer of fertile mud. And as if all this were not benefit enough, nature also conspired to ensure the seclusion of this favoured domain. Up-stream, outcrops of hard-wearing rock gave rise to a series of rapids, and in conjunction with swamps and other barriers, these cataracts served to isolate the lower reaches of the river, which were protected on either side by extensive and inhospitable deserts.

Here, then, was a region admirably suited to encourage and assist the development of primitive man, who first seems to have happened upon this hidden Valley in Paleolithic times. Significantly, evidence of this early occupation is confined to the crests of the surrounding cliffs, the implication being that the river banks were the haunt of large numbers of crocodiles and other unwelcome beasts.

During the New Stone Age, however, the settlers braved these dangers to plant their crops, and so were led to devise methods of irrigating the land as their numbers grew and their food requirements increased.

As many as half a hundred individual communities established themselves along the stretch of the river which lies between the first cataract and the sea, and unification early took place to the extent that two rival kingdoms appeared—that of Upper Egypt (the Valley inhabitants), and that of Lower Egypt (the Delta people). About 3,500 B.C. the indigenous population, who were members of the Hamitic branch of the Caucasian race, appears to have been forcibly joined by Semitic newcomers, and intermarriage with these and other intruders subsequently produced the ancient Egyptians, a people of somewhat mixed origin exhibiting both African (Negroid) and Asian strains.

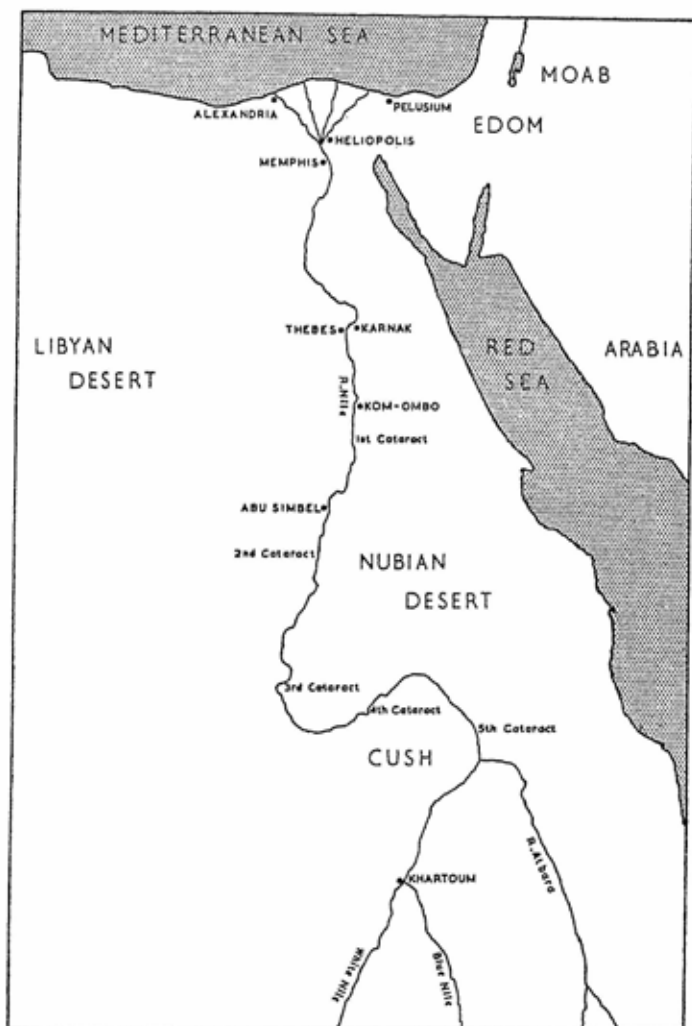
But after having endured, though not without interruptions, for an unprecedented 3,000 years, the rule of the native Pharaohs (as the kings of Egypt came to be known) at last gave way to that of a succession of interlopers of various nationalities—Libyan, Nubian, Assyrian, Persian, Greek, and Roman among them—as neighbouring empires rose and fell in the never-ending struggle for world supremacy. And by the time the fifteenth century A.D. saw the ending of the Dark Ages in Europe, and the revival of an active interest in learning there, the luckless peoples of the Nile, after suffering long years of persecution under the Arabs, had more recently become subject to the untender mercies of

the Turks, the concern of whose leaders for the greatness of the Egyptian past was as non-existent as their solicitude over the miseries of the Egyptian present.

In their search for information about the land of the Pharaohs, European scholars, as earlier mentioned, were able to turn to the long neglected works of Greek and Roman writers who had actually visited Egypt in pre-Moslem times, though none of these accounts antedated the fifth century B.C. The most famous of these early travellers was Herodotus, who lived about 484-425 B.C. In his day, the powerful empire (of which Egypt was then a part) created by Cyrus the Great of Persia and his successors was at its height, and the Greek historian, whose home was at Halicarnassus, in Asia Minor, was born a Persian citizen.

It was while gathering material for his monumental *History* of the long and continuing conflict between Greeks and Persians, that Herodotus made his way to the Delta, and from there journeyed up the Nile, marvelling at the many wonders he saw, from the massive pyramids and the inscrutable Sphinx of Gizeh to the Labyrinth of Harawa and the so-called colossus of Memnon (in fact, one of a pair of immense monolithic statues of the Pharaoh Amenophis III, the grandfather of Tutankhamon).

The Egypt which Herodotus beheld was, of course, long past its peak, but evidence of its former greatness was everywhere to be seen in the shape of countless palaces and temples, monuments and tombs, the walls of which were covered by a strange and mysterious picture writing, composed of draw-



Map of the Nile Valley, showing the course of the river from the Central Highlands to the Delta.

ings of men and animals, heads and hands, arms and legs, and of boats, buildings, furniture, weapons, and the like.

The Greek historian expressed a particular interest in the Nile itself, inquiring, among other things, as to its length and its source, and the reason for its strange behaviour in flooding each summer, at a time when all ordinary rivers were at their lowest ebb. His curiosity, however, remained unsatisfied, for the Egyptians themselves did not know the answers to these questions. To them, the river's beginnings were a profound mystery, for as far as they had been able to trace its course, it flowed through desert regions where rain was unknown. As for the annual inundation, upon which their agriculture depended, this was no less inexplicable. It was maintained by some that the flooding was caused by winds from the north, which held back the river water and so prevented it from reaching the sea, or, alternatively, that a periodic change in the level of the ocean was responsible, while others suggested (with good reason, as we now know) that melting snows and heavy rains were responsible. Yet, the puzzled Herodotus asked himself, how could this be so, when the further one travelled up the seemingly endless waterway, the more unbearable the heat became, until eventually a land was reached where the sun was so hot that it burned the skins of men black?

Inasmuch as the claims of the Nile vie with those of the Mississippi-Missouri and the Amazon for the title of the world's longest river (the length of all three exceeds 4,000 miles), it is not surprising that

the ancient Egyptians failed to find the beginnings of their revered waterway, a riddle which remained unsolved until as recently as a century ago. Its source was finally traced to Lake Victoria, in Uganda, the waters of which pour over the rim of the Lake near Jinja, to become in succession the Victoria Nile, the Albert Nile, and the White Nile. At Khartoum, in the Sudan, the White Nile is joined by the Blue Nile from Lake Tana in the Abyssinian Alps, and 200 miles further downstream by the Atbara, called also the Black River.

From here on, the Nile journeys no less than 1,600 miles to the sea without receiving a single tributary on either bank. As for the annual flooding, this is indeed caused by winter rains in the central highlands, and by the melting snows of the Abyssinian mountains. But because of the river's great length, the successive flooding of its component streams does not affect Egypt until June, whereafter the level of the river continues to rise for several months.

Attempts to control the upsurge have been made since time immemorial, and, thanks to a series of dams of modern construction, there has been no inundation since 1902. At Assuan, where the most important of these reservoirs is located, some 600,000 million gallons of water are impounded and released when required, thus enabling two and even three crops to be produced each year.

Herodotus did not live to see the end of the Greko-Persian conflict, but within a century of his death there took place a series of battles in which the Persians were decisively defeated by Alexander

the Great on their own ground. An immediate outcome was the acquisition of Egypt by the victors as part of the spoils, an event which led to the establishing of a Greek monarchy (the Ptolemies) in the land of the Pharaohs.

Historical research was encouraged by the new rulers, at whose court, during the reign of Ptolemy II Philadelphus, there lived an Egyptian scribe called Manetho. At the request of his royal patron, this learned priest compiled a detailed history of Egypt, and, though his account was written in Greek, it was based on monumental and other hieroglyphic records.

Manetho's history, alas, did not survive the destruction of the famed Library of Alexandria which took place in later years, though it has come down to us in part through the labours of copyists, among them Josephus and Julius Africanus, who quote from it in their own writings.

From these sources, it is known that Manetho divided the long line of Egyptian kings into thirty-one dynasties or royal houses, each distinguished by a geographic epithet indicative of its place of origin—the Thinite Dynasty (of Thinis); the Memphite Dynasty (of Memphis); the Theban Dynasty (of Thebes); and so on. Moreover, according to Manetho, no fewer than three-hundred and thirty kings had sat on the throne of Egypt since the time of Menes, who united the rival kingdoms of Upper and Lower Egypt, and so became the first of the dynastic rulers.

But although Manetho listed names and individual reign-lengths, his copyists made mention

of only some of the monarchs, and for purposes of their own so falsified the details relating to regnal years as to render them worthless. As a result, not a little of the information about ancient Egypt obtainable from classical sources was highly unsatisfactory and even contradictory, and it was by no means easy to distinguish fiction from fact.

The Napoleonic invasion of Egypt did much to make possible on-the-spot investigations, but even when Mariette, as head of the Department of Antiquities, put an end to the escapades of Belzoni and his kind, the unlawful robbing of tombs still went on at the hands of native Egyptians.

The authorities were fully alive to the situation, but the malpractice was far from easy to detect, and hence almost impossible to prevent. However, the fact that an unofficial discovery of considerable importance had been made came to their notice in 1876, when various genuine antiquities mysteriously appeared on the market. But although diligent enquiries were made, several years went by before the relics were traced to their source.

Suspicion eventually fell upon an Arab by the name of Abd-el-Rasul, whose arrest was ordered after he had been trapped into selling a number of items to a government agent posing as a rich foreign buyer. Despite resort to beatings and other methods of persuasion, however, Rasul continued to deny that he knew where the finds had been obtained, and, after weeks of cross-examination, he was released for lack of evidence.

Later, in the knowledge, it may be, that henceforth he would be a marked man, the culprit re-

vealed that the people of his village of Kurnah, near the Valley of the Tombs of the Kings, had for generations been professional grave robbers, and that the community was at present enjoying great prosperity, thanks to a fabulous source of wealth of which he, Rasul, knew the secret. And in return for the promise of a pardon and a suitable reward, this secret he undertook to reveal.

So it came about that in 1881, Emil Brugsch, on behalf of the Department of Antiquities, was taken by Rasul to the vicinity of Der-el-Bahri, where, in a corner of a secluded gully, he was shown the dark, square-cut opening of a shaft which dropped almost vertically for 40 feet into the solid rock. At the bottom of this cutting, a 200-foot long passage led to a chamber, and to an even longer passage, in which Aladdin's Cave the astonished Brugsch beheld an unprecedented accumulation of coffins and mummies, vases and chests—archaeological treasure beyond belief, piled high to the roof in the utmost confusion!

Prior to the making of this amazing discovery, the tombs of the famous Valley of the Kings had invariably been found looted and empty, the carefully preserved bodies of their royal owners gone, it had seemed, for ever. But here, safely hidden in the depths of this isolated shaft, there were found the missing coffins and mummies of a host of Pharaohs and some of their Queens, representative of half a dozen dynasties, together with the remains of princes, high priests, and other important personages!

What lay behind this unceremonious dumping of

the bodies of some of the most famous kings in Egyptian history—Amenophis I, Thuthmosis II, Seti I, and Rameses II among them? The answer, as it happened, was provided by various papyri, which recorded how, some 3,000 years ago, during the reign of Rameses IX, certain of the royal tombs in the Valley were found to have been entered and robbed. An immediate investigation was held, and the offenders caught, questioned, and punished. But the plundering continued, and during the next century and a half, the position became so serious that the Valley guardians at last decided to remove the royal mummies from their rifled sepulchres, and give them a mass burial in a few secluded hideouts, where it was hoped they would be safe. And that the plan succeeded, at any rate for long enough to ensure that the royal remains fell into appreciative hands, we now know.

A similar discovery was made some years later, in 1898, when Victor Loret, acting on information received, located the tomb of Amenophis II. Although, like other tombs in the Valley, it had been plundered long ago, the mummy of the Pharaoh was still there, lying beside an open sarcophagus—a find unique at the time, for the discovery of Tutankhamon and his treasures had yet to come. Nor was Amenophis alone, for hidden behind a wall in a side chamber, Loret found another collection of royal mummies!

Elsewhere in Egypt, meanwhile, other investigators had been making a series of equally important, if somewhat less spectacular, finds. In 1881, the year in which Brugsch was taken to the Der-el-

Bahri cache, Maspero found and entered a group of five pyramids which antedated the rock-hewn Valley tombs by 1,000 years.

These age-old structures, belonging to kings of the 5th and 6th dynasties, had also been forcibly entered and rifled in ancient times. They nevertheless proved to be of great archaeological interest, for unlike the earlier and more imposing structures of the 4th dynasty Pharaohs at Gizeh, the walls of the internal passages and chambers were found to be covered with hieroglyphic inscriptions, now famous as the Pyramid Texts.

Six years later, in 1887, a peasant woman grubbing for phosphate fertilizer at a site located about midway between Memphis and Thebes, inadvertently brought to light a collection of baked clay tablets, inscribed in Assyrian cuneiform—the diplomatic language of early times. The tablets proved, on examination, to be the Egyptian foreign office records of Amenophis III and IV, and to consist of copies of official correspondence which had been sent to, and received from, various independent rulers, vassal kings, and Egyptian governors in Palestine, Syria, and elsewhere. Now known as the Tell el-Amarna Letters, these priceless documents furnished historians with a wealth of interesting information about events *circa* 1400 B.C., not only in Egypt, but throughout Western Asia as well.

Not long after the making of this great discovery, Flinders Petrie turned his attention to Fayum, where he identified Lake Moeris, the scene of hydraulic works undertaken by Amenemhet III, and found the vast complex of palace buildings which

Herodotus had named the Labyrinth, so impressed was he by their size and extent.

About this time, too, Petrie explored the pyramid of Amenemhet at Hawara, the first to do so in modern times. As is now apparent, when this 12th dynasty tomb was designed, it had been realized that mere mountains of stone were insufficient to defeat the plunderer. Accordingly, additional and highly ingenious safeguards were introduced, about which, of course, the unsuspecting Petrie knew nothing.






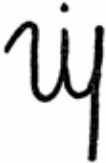



The movable block of stone used to hide the entrance to the interior passages of earlier pyramids had been located on the north face. The architects of Amenemhet III, however, cunningly reversed the usual procedure, and placed the secret entrance on the south side—as Petrie, after much time and trouble, eventually discovered. He then found himself standing at the top of a flight of steps which led down to an empty chamber. Seemingly, this was all. But hidden in the ceiling of the room was a secret panel which covered an opening giving access to two passages at right-angles to one another. One of these passages led to a second empty room, while the other was full of loose masonry, and thus invited attention. The blocked passage, however, was a blind, and it was from the empty room that a movable panel in the ceiling disclosed another corridor, though once again this appeared to be a dead end. A third sliding panel, however, revealed the existence of yet another corridor, in the floor of which was a deep well, and beyond this obstruction another chamber and a second well. The way

to the hidden tomb, however, was concealed elsewhere—not, on this occasion, in the ceiling, but in the floor, from where a short passage led to a final barrier in the shape of a 45-ton block of stone. But all these elaborate precautions to make the place thief-proof had been devised in vain, as Petrie discovered when he reached the block of stone. Centuries earlier, some enterprising vandals, on encountering this immovable barrier, had laboriously mined their way through it, and so gained the treasure chamber beyond!

As a result of the investigations of Petrie and his colleagues, much was learned about the early history of Egypt, and about the customs and beliefs of its people—thanks also to the ever-increasing knowledge of the hieroglyphs which had followed Champollion's achievement of 1822.

From that time on, hesitantly at first, the very monuments began to speak, as one inscription after another provided details of some battle or expedition, or named the occupant of this or that tomb. The ancient Pyramid Texts which Maspero discovered proved to be incantations, designed to ensure that each of the departed monarchs secured his rightful place in the pharaonic heaven, where there dwelt many powerful deities, including Re the sun god (later identified with the god Ammon, of Thebes), in whose ship the dead king was conveyed majestically across the sky.

The Texts also related the myth of the divine Osiris, who, after suffering death at the hands of his brother Set, was resurrected with the assistance of Anubis, the jackal, and thereafter reigned in the

1	2	3
		
		
		

The three kinds of ancient Egyptian writing. Note how, in the course of centuries, the pictorial hieroglyphs (column 1) progressively degenerated into the cursive and less easily recognizable hieratic and demotic forms (columns 2 and 3).

underworld as the King of the Dead. His son Horus (the hawk) determined to avenge the killing of his father and, in the ensuing conflict, Set assumed the form of a black pig, with the result that this luckless animal came to be looked upon as the personification of evil. At all events, the ancient Egyptians had a taboo against using its flesh for food, as is indicated by the following instruction given at the end of a spell found in a coffin of a later period :

Not to be spoken while eating pork!

Information about the scientific attainments of the ancient Egyptians is provided by various mathematical papyri, from the contents of which it is evident that, although a decimal notation was employed, the system was somewhat cumbersome in use (twenty-seven signs were needed to write 999) ; while medical practitioners seem to have placed considerable reliance upon hygiene and dietetics, though when these failed, drugs such as alum, copper sulphate and oil of cedar were available for administration to the luckless patient.

General literature takes the form of admonitions to the young (rise early ; work hard ; keep sober ; respect the law) ; and lamentations about the miseries of the present, and the passing of the good old days.

There are also fables and short stories, some of which proved so popular that they are found repeated down through the centuries. One account of unusual interest, in that it reflects the decline of pharaonic power in later years, is entitled the *Voyage of Wenamon*. It relates how an official was sent from Thebes, charged with the task of obtaining

supplies of timber required for the building of a sacred barge which it was intended to dedicate to the god Ammon, and of the scant respect which this emissary received from the ruling princes of the once subject towns of Dor and Byblos, on the Mediterranean coast.

But of even greater historical interest were the official records set up by successive Egyptian kings on stelae and on temple walls, in which they told, often in the most boastful tones, of their activities and achievements. Thanks to the details thus provided, many individual monarchs were identified, and allocated to one or other of the thirty-one royal houses which make up Manetho's dynastic framework.

At no time, of course, was there any difficulty about the Ptolemaic end of the line, for Alexander's conquest of Egypt was known to have taken place in 332 B.C. But what date was to be ascribed to the shadowy Menes, traditionally regarded as the first of the dynastic rulers?

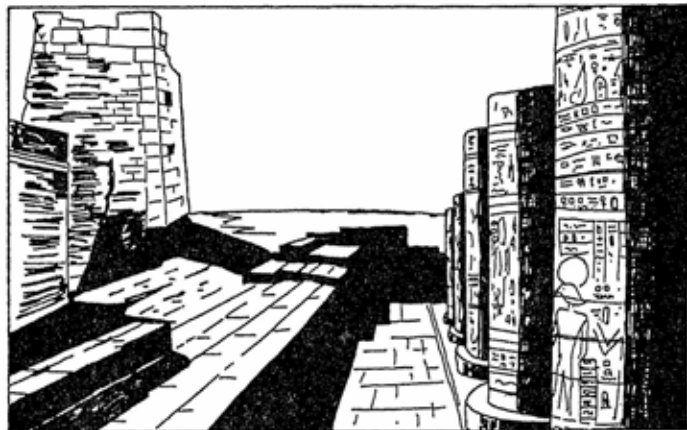
Herodotus, on being informed that there had been no less than three-hundred and thirty kings of Egypt since the unification of the country, allowed a period of 100 years for every three generations, and so reached the conclusion that the royal line extended back almost to 12000 B.C.! This highly improbable figure Champollion amended to 5867 B.C., Mariette to 5004 B.C., and Petrie to 4777 B.C.—successive reductions brought about by an increase in knowledge.

In part, these estimations were based on native king lists (notably the much-damaged Turin Papyrus, and a fragmentary 5th dynasty stele, one important piece of which is known as the Palermo

Stone), but they also took account of certain astronomical observations. The Egyptians early took note of the annual reappearance above the horizon of Sothis (Sirius), the brightest star in the heavens, and they were aware that it completed its celestial revolution in very nearly $365\frac{1}{4}$ days, a period which closely approximates that of the true solar year. The Egyptian civil year, however, comprised exactly 365 days, with the result that, relative to the seasons, the calendar fell back 1 day every four years, a discrepancy which automatically corrected itself every $365 \times 4 = 1,460$ years. In effect, 1,461 calendar years equalled 1,460 Sothic years.

The circumstance is of interest, because it was occasionally mentioned in the records that the Sothic rising had taken place on a certain day of a given year of a particular monarch, thereby providing the modern investigator with what is termed a double date, that is, an association of a royal date with a natural date, which last can be calculated with the aid of astronomical tables. In this way, for instance, a year in the reign of Tuthmosis III was established as having fallen somewhere between 1474 B.C. and 1470 B.C. (within, that is to say, the four year period needed to make a difference of one day in respect of the Sothic year)—a useful "fix" which also served to determine the duration of the 18th dynasty to which this monarch belongs.

As it happens, events relating to the comparatively recent 18th dynasty, and hence the date of the dynasty itself, can be confirmed from outside sources, such as the Tell el-Amarna Letters. But external synchronisms such as this are less easy to



The ruins of Kom-Ombo, a temple on the Upper Nile.

find in regard to earlier dynasties, so that, although another double date enables the start of the 12th dynasty to be reckoned with precision, the calculation is subject to a possible error amounting to an entire Sothic cycle—a matter of 1,460 years. Thus it came about that what may be termed Petrie's "high" date of 4777 B.C. for the advent of Menes was later challenged by E. Meyer and J. Breasted, who boldly advocated a "low" date of 3300 B.C. or thereabouts.

Both dates offered certain difficulties, and for many years there was much argument between Egyptologists as to their respective merits. Today, the lower dating is almost everywhere accepted, particularly since radio-carbon tests made with materials from the tomb of a contemporary of King Udi, of the 1st dynasty, have declared in its favour.

Chapter Six

THE LAND BETWEEN THE RIVERS

ABOUT 1,000 miles due east of the Nile delta, on the far side of the Arabian Desert, lies the head of the Persian Gulf, into which, from time immemorial, there have drained the waters of another fertile and long inhabited valley.

This region, in ancient times the home of Assyrians and Babylonians, is remarkable in that it contains not one, but two great rivers—the Tigris and the Euphrates, the respective lengths of which are 1,150 and 1,460 miles. Both rise in the highlands of Asia Minor (modern Turkey), and thereafter pursue a converging course as far as Baghdad, at which point they approach within 35 miles of one another. The gap between them then widens to 100 miles or so before the rivers again converge and meet at Qurna, there to form the stream known as the Shatt al-Arab, the waters of which journey for another 115 miles before joining those of the Gulf.

In their upper reaches, both the Tigris and the Euphrates are confined to well-defined channels. But beyond Baghdad the countryside levels out into a vast open plain, across which the rivers flow between raised banks of mud and silt of their own



Map of the Tigris-Euphrates Valley, showing the location of some of the ancient sites.

making. Here, with the melting of mountain snows in the spring, considerable flooding is liable to occur, and this is particularly so in the case of the Tigris, the swifter of the two streams, whose waters can rise at the phenomenal rate of a foot an hour (in London, if the level of the Thames increases by so much as an inch an hour, it is cause for anxiety

and comment). Maximum levels are reached in April (Tigris) and May (Euphrates), and they are usually of the order of from 12-20 feet above normal. But on occasion (as happened as recently as 1954) rises of 30 feet or more take place, with disastrous consequences to the surrounding countryside, as the swollen rivers pour over their raised banks.

From 550 B.C. onwards, the Greeks, who named this double valley Mesopotamia ("the land between the rivers"), became involved in a long series of wars with its Persian conquerors. A most informative account relating to one of these incidents has been provided by Xenophon, who in 401 B.C. accepted an invitation to join some Greek mercenaries at Sardis. The aim of this force was to assist the cause of Cyrus the Younger, a prince of Persia who was planning a revolt against his brother the king. But in the ensuing battle of Cunaxa (near Babylon), Cyrus was killed, and the generals and captains of the mercenaries were treacherously murdered at a subsequent parley. Some 10,000 Greeks thus found themselves marooned and leaderless in the midst of a hostile land, and it was the resourceful Xenophon who led them on a homeward march of 1,500 miles, fighting as they went.

The story of this famous exploit is told in Xenophon's *Anabasis*, and the account is of archaeological as well as historical interest. It describes how, on reaching the banks of the Tigris, the marchers came upon the extensive ruins of a great city, its walls 25 feet wide, 100 feet high, and with a circumference of 7 miles. And a day's march (20 miles) further on, the Greeks encountered another

vast and deserted city, which boasted even higher walls.

Xenophon vouchsafes the information that the ruins were those of the Median cities of Larissa and Mespila, and that they had been attacked and destroyed by the Persians. But in fact, as we now know, they were the still-standing remains of Calah and Nineveh, two of the renowned capitals of Assyria, which had been taken and looted two centuries earlier by the Medes and the Babylonians. The fruits of this victory, however, were not long afterwards wrested from the allies by Cyrus the Great of Persia, who rose in revolt against his Median overlord.

In its turn, the mighty Persian Empire ultimately fell before the onslaught of Alexander, who thus emerged as the conqueror of the then known world. And on his death at Babylon in 323 B.C., his generals shared the spoils. Egypt went to Ptolemy the son of Lagus, while Persia and its neighbouring lands, including Mesopotamia, were secured by Seleucus. Both these leaders in due course founded Hellenic dynasties (the Ptolemies and the Seleucids) in the countries of their choice, and just as the Egyptian scribe Manetho was later encouraged to compile a history of his people, so Berosus, a priest of the temple of Bel at Babylon, was moved to prepare a detailed account of events in Babylonia. The result of his labours, written in Greek, was published in three volumes during the reign of the third of the Seleucids, Antiochus II (261-247 B.C.), and, like its Egyptian counterpart, the work has been preserved for posterity only in the extracts of copyists.

According to Berosus, a multitude of foreigners settled in Babylonia in very early times, and their condition remained exceedingly primitive until there emerged from the Erythrean Sea (the Greek name for the Persian Gulf) a race of beings, half fish and half men, whose leader was called Oannes. These newcomers settled along the coast, and brought with them a knowledge of agriculture and the working of metal, and moreover introduced the art of writing. The country was ruled by a succession of eight (or ten) kings (about this, the accounts of the copyists are not in agreement), whose reigns amounted in sum to the obviously fabulous period of 241,200 (or 456,000) years, at which juncture the royal line was abruptly terminated, for the last name on the kings list is followed by the ominous announcement:

The Flood came. After the Flood came, kingship again came down from on high.

Then are given the names of kings who belonged to dynasties associated with such ancient cities as Kish, Erech, and Ur, two of which find mention in Genesis. Here, however, the founding of Erech is fancifully attributed to Nimrod, a great grandson of Noah, while Ur ("of the Chaldees", so-called) is named as the home of Abraham, the acknowledged founder of the Hebrew people, whose traditions, significantly enough, also contain a Deluge story.

But this apart, the Old Testament record provides little enough information about early events in the Tigro-Euphrates Valley, though there are references

to the Assyrians and to their successors the Chaldeans (Neo-Babylonians) whose kingdom, under Nabonidus (the father of the Belshazzar who saw the writing on the wall) was acquired by Cyrus the Great in 538 B.C.

The lack of knowledge about the early days of Babylonia continued until the eighteenth century A.D. though prior to this, European travellers had visited the area in search of historically famous sites. Nineveh appears to have eluded them, but apparently little difficulty was experienced in identifying the remains of once mighty Babylon, and between 1781 and 1784, J. Beauchamps explored its extensive ruins and recovered a number of inscribed bricks, which he sent to Paris for examination.

Some 25 years later, C. J. Rich was appointed British Consul at Baghdad, and, on learning of Beauchamps' activities, he hired some labourers (whose wages he paid out of his own pocket) and set them to digging among the tell-tale mounds which dotted the Babylonian plain. He first gave his attention to the mound of Kuyunjik, one of two rubble heaps which lay opposite the modern town of Mosul. But despite reports of interesting finds having been made there by natives, all he recovered during this and subsequent excavations were a number of bricks, some broken pottery, and several inscribed fragments. These few remnants eventually found their way to the British Museum, and as A. H. Layard subsequently remarked, until 1842 they represented all that remained, not only of the once famous city of Nineveh, but of Babylonia itself!

It was in 1842 that Paul Emile Botta, after serving

as French Consul in Alexandria, was transferred to Mosul. And not long after taking up his new appointment he also set men to digging into the larger of the two mounds. These efforts also yielded singularly little, and it remained for a native onlooker to suggest that a more promising site was to be found some ten miles away, in the shape of a mound named after the superimposed village of Khorsabad.

Botta accordingly transferred his attention to this site, and began work there by excavating a hole in the centre of the mound, thus revealing the top of a wall. Further digging showed that the base of this wall was lined with carved slabs, whereupon a trench was opened up from the edge of the mound, aimed at the trial pit. Botta then discovered that he had uncovered a hall, from which doorways led to other rooms. The hall, moreover, was lined with sculptured slabs which evidently recorded the deeds of the builder, whose activities, presumably, were also extolled in a series of accompanying inscriptions, composed of lines of strange, wedge-shaped characters. Botta concluded that the site was that of Nineveh, but it was subsequently identified as Dur-Sharrukin (Sargonsburg, a new capital city built by the Assyrian monarch Sargon II). But whatever the name of the place, the find was clearly one of importance, a fact which the French government at once recognized by providing the discoverer with ample funds with which to continue his work.

It chanced that A. H. Layard, an English scholar, passed through Mosul when Botta was still engaged in digging to little purpose there. But when, having

in the meantime reached Constantinople, he heard of the success later achieved at Khorsabad, Layard determined to undertake some excavation himself. His choice fell upon a mound which was situated lower down the Tigris, known to the Arabs as Nimrud (Nimrod), but which was, in fact, the site of Calah. Layard's immediate concern, however, was the all-important question of how to raise the necessary funds, for, unlike the French authorities, the British Government showed no interest in the matter, nor was the British Museum disposed to assist. In the end, it was left to Sir Stratford Canning, who held a ministerial post in Constantinople, to finance the expedition from private means.

Layard began work in 1845, and quickly ran into trouble with the local Pasha, who had convinced himself that a search for hidden treasure was in progress, and who was determined at all costs to secure for himself anything of value that might be found. Happily, this scheming rogue was recalled by the Turkish authorities, and replaced by a more co-operative representative, and the work then went on smoothly enough.

The excavator was soon rewarded by a number of interesting discoveries, notable among which was the finding of a series of palace buildings, including one which had belonged to Shalmaneser III, in which royal residence the now famous Black Obelisk was found. This inscribed block of stone describes the expeditions and conquests which enlivened the monarch's 35-year reign, and the account is illustrated by five rows of carved reliefs, the second of which depicts King Jehu of Israel

(or an emissary) offering a gold and silver tribute as a token of submission.

From the mound of Calah, Layard went to that of Kuyunjik at Nineveh, where two more royal residences were uncovered, one belonging to Sennacherib, and the other to Ashurbanipal, a reference to whose literary interests has already been made. It was among the ruins of the palace of this monarch that Layard happened upon two comparatively small rooms, the floors of which were piled high with damaged and undamaged clay tablets—the remains of the royal library, no less. There were more than 20,000 documents in all, and this precious find, in due course consigned to the British Museum, was destined to throw a most revealing light upon the early history of Mesopotamia, and upon many of the ideas and beliefs of the inhabitants.

At the time of this discovery, the decipherment of the various cuneiform writings was far from complete, but it transpired that the Assyrian tongue was a dialect of Accadian (Babylonian), a growing understanding of which language enabled the correct value (Shar) to be assigned to a syllable of the name of Sargon II (Sharrukin), thus identifying the builder of the palace at Khorsabad which Botta had found. And subsequently, the contents of the Ashurbanipal library did much to establish the hitherto unsuspected existence of an Old Babylonian Empire, the forerunner of the later kingdom of the Chaldeans. At the same time, the records also made it clear that the culture of Nineveh, like the language of its inhabitants, was essentially Babylonian.



Head of the Assyrian monarch Ashurnasirpal II (9th century B.C.), as depicted on sculptured reliefs found among the ruins of his palace at Calah.

The first dynasty of Babylon, it appeared, had been founded about 1900 B.C., among its rulers being Hammurabi, the sixth and most famous of the royal line, who had conquered the whole of Mesopotamia, including the upper regions of the Tigris around Assur (Assyria). Under the kings of the 2nd dynasty, however, the power of Babylon gradually declined, and from 1600 B.C. the country was ruled by Kassite invaders (who constituted the 3rd dynasty) for several centuries. Then the Elamites raided the land, killing the Kassite king, and so preparing the way for the emergence of the 4th Babylonian dynasty, the greatest of whose rulers was Nebuchadnezzar I. He attacked the Elamites and defeated them, but was in turn assailed by the Assyrians, and after a long series of disastrous wars with this rising northern power, Tiglath-pileser III made himself king of Babylon, and the ancient kingdom became part of the Assyrian Empire. It so remained until its ruler Nabopolassar (Chaldean, "son of a nobody") rebelled against his overlords, and in the fourteenth year of his reign, in alliance with Cyaxares of Media, captured and destroyed Nineveh, after which the once all-powerful Assyrian nation, which had terrorized the peoples of Western Asia for centuries, ceased to exist.

But the labours of Rich, Botta, and Layard, it soon became evident, had concerned relatively modern remains, and during the 1850's, some of the many sites known to exist in lower Babylonia were investigated. On behalf of the British Museum, W. Kennett Loftus undertook a preliminary excavation of what proved to be the ruins of Eridu, Erech, and

Larsa, three of the oldest cities in the land, while J. E. Taylor, the British Consul at Basra, did some exploratory digging at the no less venerable Tell al-Mughair (the mound of Pitch), otherwise Ur.

Next, Ernest de Sarzec, Taylor's French opposite number, attacked the hitherto undisturbed mound of Tell-Loh (Tello), the site of ancient Lagash, and there uncovered new and distinctive art forms, together with documentary records couched in an unknown language—highly significant discoveries which prompted the sending of other expeditions to the region.

Evidence of the existence of an earlier, pre-Babylonian civilization in Mesopotamia had already been noted by H. C. Rawlinson, one of the foremost cuneiform scholars of his day. Both the Accadian and the Assyrian tongues had been found to exhibit a variety of characteristics which at once classed them as Semitic, but in 1855, when working on some supposedly Babylonian tablets sent to him from Larsa by Kennett Loftus, Rawlinson was puzzled to find that he could make nothing of them. It was evident, indeed, that the language was not Accadian, and that neither was it Semitic.

In the following year another scholar, E. Hincks, recognized that the unknown tongue was what philologists term agglutinative, in that it was characterized by long compound words, formed by the addition of prefixes and suffixes to the root, as in *disband*, *babyhood*. But all attempts to discover the affinities of the language were unsuccessful, and in the absence of such a guide, the prospect of decipherment appeared exceedingly remote. But at this

juncture Rawlinson and a colleague, while at the British Museum examining documents recovered by Layard from the ruins of Nineveh, made a dramatic find: some of Ashurbanipal's records were in the form of lexicons and phrase books, designed to assist Assyrian learners of the unknown tongue! This timely discovery provided the necessary key, and a perusal of the documents revealed references to monarchs who styled themselves "King of Sumer and Accad", evidently an indication that ancient Babylonia had been divided into a lower and an upper kingdom—a coastal Sumer, and an inland Accad.

It thus appeared that at one time two distinct peoples were in occupation of these areas, the Semitic Accadians, and the non-Semitic Sumerians. And, earlier still, such evidence as is available suggests that the Mesopotamian plain was inhabited by a primitive race which, at some indeterminate date, made way for an alien and relatively civilized intruder—the Sumerians. As for the Accadians, their ancestors may, or may not, have been the original settlers. All that can be established with any certainty is that by 3500 B.C. both peoples were in occupation of their respective areas.

Philological investigation has shown, however, not only that the language spoken by Babylonians and Assyrians is Semitic, but that so also is the speech of the Amorites and Aramaeans, the Phoenicians and the Arabians, and, of course, the Hebrews. All of these tongues are, in fact, closely related to one another, and were evidently spread throughout the Near East by the movement of peoples who emanated from a particular region.

This region has now been identified, with some probability, as Arabia, a neck of land bordered on three sides by the Red Sea, the Persian Gulf, and the Indian Ocean.

Significantly, although Arabia can claim to be the largest peninsula in the world, it is for the most part desert, with no more than a narrow margin of habitable land around its coasts, so that any considerable increase in population would make necessary a periodic migration of its surplus inhabitants. Moreover, hemmed in as they were between the desert and the sea, only two land routes would be open to them—along the peninsula's western seaboard to the Nile, or along its eastern coast to the head of the Persian Gulf. And the indications are that, from time to time, both ways of escape were followed.

Egypt and Mesopotamia each appear to have received an influx of Semitic-speaking peoples about 3500 B.C. In the Nile Valley, the amalgamation of the newcomers with the resident Hamitic population is believed to have produced the Egyptians of history, while in the Tigro-Euphrates region the migration introduced (or served to reinforce) the Semitic Accadians. Thereafter, at more or less regular intervals of about 1,000 years, there followed the forerunners of the Amorites and the Canaanites (*c.* 2500 B.C.), of the Aramaeans and the Hebrews (*c.* 1500 B.C.), and of the Nabataeans (*c.* 500 B.C.). The last great exodus from the peninsula, which took place well within historic times, resulted in the Arab invasions of Western Asia and Egypt during the 7th century A.D.

About the origin of the non-Semitic settlers in the Land of Sumer, little or nothing is known. Some authorities incline to the view that the Sumerians came from the region between the Caspian and the Black Seas, while others associate them with the east. In either case, from the fact that the newcomers undertook the building of tall, pyramidal structures known as ziggurats, atop of which were perched their temples, it has been inferred that they thereby sought to reproduce on the flat, Mesopotamian plain a feature associated with an earlier and mountainous homeland.

However this may be, the Sumerians soon adapted themselves to conditions in their marshland abode, developing in the process a unique culture which expressed itself in architecture and engineering, in writing and language, in civil administration and religion. The centres of this civilization, notable among which were Eridu, Adab, Larsa, Uruk, Lagash, and Ur, assumed the form of independent states. These communities were often in conflict with one another, and from time to time this or that city would dominate the remainder.

Wars were also fought against neighbouring countries, on occasion with disastrous consequences. Thus about 2450 B.C., the whole of Babylonia was subdued by Sargon of Accad, though as it happened Sargon's Empire was shortlived, for during the reign of his grandson Naram-Sin, the land was overrun by barbaric hordes known as the Gutium. With the eventual defeat of these invaders, Sumer regained a fleeting independence, and there flourished the illustrious 3rd dynasty of Ur under Ur-

Nammu and his successors. But not long after this temporary resurgence, the Sumerians lost their national identity with the arrival of, and their absorption by, the Amorites (westerners), the Semitic founders of the famous 1st dynasty of Babylon.

These events are clearly reflected in the written records of the participants, and just as the tablets of the Assyrians provided evidence of extensive borrowing from the Babylonians, so the culture of the Babylonians revealed itself to be essentially Sumerian—a knowledge of which language, as the existence of phrase books and dictionaries goes to show, was preserved for learned use by the Semites, in much the same way as the long defunct Latin tongue continues to find employment in medical and ecclesiastical circles today.

Among other of their achievements, the Sumerians produced a literature devoted to epic stories about the creation of the world, about the innate shortcomings of man, and about an attempt by the high gods to sweep him off the face of the earth by means of a flood to end all floods. But the attempt failed, because after it had been decided that the wickedness of man merited his extinction, Ea (otherwise Enki), the god of the deep, warned a worthy citizen by the name of Ut-Napishtim of what was afoot, and advised him to prepare for coming events by building a ship, six stories high, and to make it watertight by smearing it with pitch, inside and out. After Ut-Napishtim and his family were safely aboard, accompanied by a representative selection of animal life, a great storm broke upon the world, and six days of continuous rainfall produced

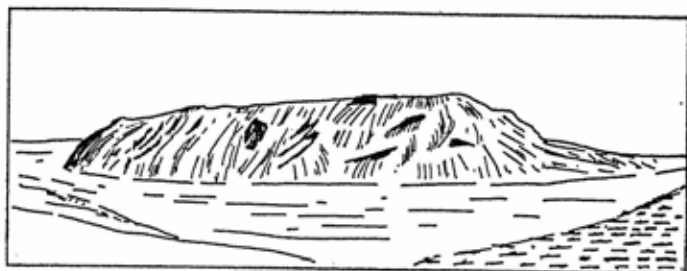
such extensive flooding that only the occupants of the six-storied vessel were left alive. But on the seventh day the storm abated, and on the eighth day the ship drifted on to the top of the mountain of Nisir, and there came to rest. A dove was then let loose, but it could find no other land on which to alight, and came back. So did a swallow, which was despatched the next day. But after a raven had been released, and had failed to return, the voyagers emerged and gave thanks for their deliverance.

That this and other tales in due course found their way into the traditions of the Semitic peoples, including the Hebrews, who incorporated them into their sacred writings for the edification of posterity, is evident enough. But have the stories any basis in actual fact?

Archaeological research has shown that they have. Although there is no suggestion that the Garden of Eden, or even its Sumerian original, ever existed, the supposed location is real enough. Hebrew references to the great river, with its four branches, one of them called the Euphrates, and another the Hiddekel (*i.e.*, Idigat, or Tigris) clearly point to Mesopotamia, and for that matter, the very name Eden is Babylonian (*edinu*, "plain"). Similarly, the origin of the story of the Tower of Babel finds an explanation in the name Babylon (Accadian, *Bablu*, "Gate of God"), and in the massive ziggurat which existed in that city.

As for the Deluge, C. L. Woolley, during excavations which he undertook at Ur from 1922 onwards, found unmistakable evidence of an unprecedented flooding which had occurred in Sumerian times. In

the course of digging a deep pit, he came upon a layer of clean silt, 11 feet thick, sandwiched between layers of earth containing the usual evidence of human occupation. Analysis showed that this layer had been water-laid, and that it was composed of material washed down from the middle reaches of the Euphrates. But although there must have been flooding on a tremendous scale to produce a deposit of such thickness, it was, of course, purely a



The Mound of Babil, rising more than sixty feet above the flat Mesopotamian plain—all that now remains of the once famed city of Babylon.

local phenomenon, confined to the Tigro-Euphrates Valley.

Woolley has estimated that the depth of water reached at least 25 feet, sufficient to inundate the whole of the territory lying between the Elamite mountains and the Syrian Desert, leaving only the larger of the Sumerian cities, on their raised mounds, showing above the swirling waters. It is thus small wonder that the event made so lasting an impression upon the mind of Mesopotamian man!

Chapter Seven

ENTER THE GREEKS

UP to a century or so ago history began with the Greeks, at that time the precursors of the earliest known civilization which was duly attested by written records—by written records, that is to say, which could be read and understood. And although there was some difference of opinion between scholars as to precisely when Greek history could properly be considered to begin, a widely accepted date was that proposed by George Grote in his well known *A History of Greece*, the first volumes of which were published in London in 1846.

Grote advocated 776 B.C., traditionally the year of the first Olympiad, as the starting point, while the arrival of the Greeks in the Aegean area was identified with the appearance, some three centuries earlier, of the iron-possessing Dorians, whose superior weapons greatly assisted them in their conquest of the Bronze Age inhabitants. It was true that the poet Homer, in the *Iliad* and the *Odyssey*, portrayed a Greek civilization which had been in existence much earlier still, and recounted events such as the Siege of Troy, but the consensus of learned opinion was that this conflict was merely a legendary tale

which belonged to the domain of fiction rather than to the realm of fact.

This notion was destined to be completely upset by the pioneer archaeological activities of Heinrich Schliemann, who, in the face of much ridicule from the experts, not only expressed a firm belief in the one-time existence of the citadel of Troy, but actually set out to obtain proof of it. This ambition, though it was not realized until Schliemann had reached middle age, was of long standing. As a boy he had been enthralled by Homer's account of the happenings which had led to the downfall of Troy, a destruction which had been brought about, so the poet said, by an amorous attachment which Paris, a prince of Troy, had formed for Helen, the wife of Menelaus, King of Lacedaemon.

After the two lovers had fled to the doomed citadel, the outraged husband, intent upon revenge, and assisted by his brother Agamemnon, set about gathering a great army. The Greek warriors assembled at Aulis, in Boeotia, and from there, 100,000 strong, set sail for the Hellespont in 1,186 ships. But the citadel was well defended, and it successfully withstood the many assaults made upon it. The siege, meanwhile, dragged on until it entered its tenth year. It was then that Epeus, at the suggestion of the goddess Athene, constructed a huge wooden horse, in the hollow body of which some of the Greeks concealed themselves, and in this way gained admittance to Troy, and so brought about the defeat of its defenders.

As a boy Schliemann knew every detail of Homer's story by heart, but when he left school

at the age of 14 it was not to engage in a search for the ruins of Troy, but to begin work in a grocer's shop. In the years which followed he became first a clerk, and then a merchant, in which capacity he travelled widely, taught himself 15 foreign languages (including Greek!) and acquired immense wealth. He had been born in 1822, and though he was now



Map of the Aegean area.

approaching his 50th birthday, he was at last in a position to set about fulfilling his childhood dreams.

His immediate difficulty was the problem of location, for there was no general agreement among the scholars about the site of the legendary citadel—not that it had ever really existed, of

course. The Troad, as the Land of Troy used to be known, was held in ancient times to be bounded by Lesbos, Phrygia, and the Hellespont—the last-named a narrow channel of water separating Europe from Asia, now called the Dardanelles. So it was here that Schliemann began his search, armed with Homer's references to such landmarks as the rivers Scamander and Simoeis, complete with marshes to avoid. But in the course of centuries rivers are apt to change not only their courses, but also their names, while swamps may dry up and vanish completely. Moreover, the outpourings of minstrels and bards are notoriously prone to exaggeration, and their geographic descriptions liable to contain imaginary details which come under the heading of poetic licence.

Schliemann decided that the river now known as the Menderes, with its tributary the Dumbrek, could reasonably be regarded as fitting Homer's description. But even so, a number of possible sites were to be found in the neighbourhood of these streams, and the place first chosen soon proved to be devoid of interest. Two years later, however, Schliemann gave his attention to the mound of Hissarlik, where digging operations begun at the northwest corner almost at once revealed the remains of a wall. It was, however, of Roman handiwork—a fact understandable enough in the light of the known history of the region, and thus encouraged, the excavator directed that a second avenue of approach be begun from the opposite side of the mound, so aimed that the two trenches would meet in the middle. It was many months, however, before anything suggestive of

an ancient citadel was found, in the shape of a substantial stone wall. This discovery was followed by the unearthing of a pair of gates, together with the remains of two buildings which showed signs of having been destroyed by fire. And near one of these structures, hidden under a 5-foot layer of ash, Schliemann found a chest loaded with treasure!

The box was found to contain more than 8,000 gold objects, and although most of them were small items such as beads and the like, there were also a number of goblets, some bracelets, and a pair of diadems. By this time Schliemann was convinced, and a once incredulous world was now inclined to agree, that satisfactory proof of the existence of Troy had been provided, and subsequent work at the site, completed by the architect W. Dörpfeld, led to the recognition of nine clearly defined levels of occupation, the 6th of which was regarded as Homeric, and the last of which was unquestionably Roman.

In more recent years these findings have been modified as a result of an extensive re-examination of the site which was undertaken by C. W. Blegen from 1932 onwards on behalf of the University of Cincinnati. No less than 46 stratified levels were distinguished, the first 10 of which were representative of a series of settlements earlier than 3,000 B.C. More than 1,500 years later the 38th occupation of the site was brought to an end by a violent earthquake, and the 39th period (Dörpfeld's Troy 7) was heralded by considerable rebuilding. But within a century (about 1200 B.C.) the fortress again suffered destruction, on this occasion by fire—the handi-

work, it is now believed, of the invading Greek hosts of whom Homer once sang.

In between his work at Hissarlik, meanwhile, Schliemann had been looking round for other sites of possible archaeological interest, and he recalled that Pausanias, a much-travelled Greek of the 2nd century A.D., had described in his *Periegesis* (Tour) how, on the way to Argos along the road called Tretus, there could be seen the hilltop ruins of ancient Mycenae. This citadel (so Pausanias declared) had been the home of Agamemnon, to which he and some of his companions had returned in triumph after the fall of Troy, only to be banqueted and then murdered by the treacherous Aegisthus, to whom, during Agamemnon's absence, his faithless wife Clytemnestra had transferred her affections. After recalling this dark deed, the Greek traveller went on to say of Mycenae:

And there is the tomb of Agamemnon there, and that of Eurymedon the charioteer, and the joint-tomb of Teledamus and Pelops, who were twins of Cassandra, and were butchered by Aegisthus (while still babes) after their parents. There is also the tomb of Electra. . . .

To Schliemann, fresh from his triumphant discovery of Troy and the vindication of Homer, there seemed not the slightest reason to doubt the veracity of Pausanias. But once again, no sooner did he announce his intention of digging at Mycenae than the proposed enterprise encountered nothing but criticisms and objections. According to Pausanias, the guilty Clytemnestra and Aegisthus had also been

buried at Mycenae, but because they had been considered unworthy to rest within the citadel their remains had been placed outside its walls. Most scholars were of the opinion that the reference was to walls which had long since vanished, and that even if any graves did exist, there was small hope of finding them. Schliemann, however, inclined to the view that the walls in question were those which were still standing, and that the area of search was thus strictly limited.

He accordingly began his excavations within the existing citadel, removing tons of earth and rubble in the process. And sure enough, cut vertically in the underlying rock surface he eventually came upon a series of shaft tombs, hewn out to a depth of 25 feet! Five such graves were at first discovered, and these, together with a sixth which came to light later, were found to contain the remains of 19 men, women, and children, accompanied by gold and silver swords, daggers, and drinking cups. The faces of the men, moreover, were covered by golden masks, while the women wore diadems of gold, and the children were wrapped in sheets of the precious metal!

An echo of this amazing discovery came in 1951, when other graves, similar in style and content, were accidentally discovered outside the fortress walls, thus further verifying, it seemed, the information furnished by Pausanias. But while Schliemann, understandably enough, was fully persuaded that he had gazed upon the face of Agamemnon and his murdered companions, a more accurate dating of the finds has indicated that they belong to the 16th

century B.C., and that the occupants of both groups of graves lived and died some 300 years *before* the accepted date of the Trojan War. Nevertheless, the discovery afforded evidence of the existence on the Greek mainland of a Mycenaean civilization which was as unsuspected as it was unknown. Who were these people, and from whom had their culture been derived? The answer to these questions, when at last it was found, was provided by other archaeological activities on the near-by island of Crete.

Geographically, the Aegean area of the Mediterranean basin is conveniently divisible into three regions—the Greek mainland (in essence, a southward extension of the Balkan Mountains); the Archipelago (a collection of numerous islands, including the 200-odd of the Cyclades Group); and Crete (a relatively large island lying some 60 miles south of the mainland, and situated almost equidistant from Europe, Africa, and Asia).

The significance of Crete is thus to be found in its location, for placed as it was, it was inevitable that its inhabitants should have been influenced by the advanced civilisations which developed in Egypt and Mesopotamia. That contacts with these lands was early established is suggested by Homer's reference to the presence of no less than five linguistically distinct peoples on the island, though to this day the original home of the ancient Cretans is not known.

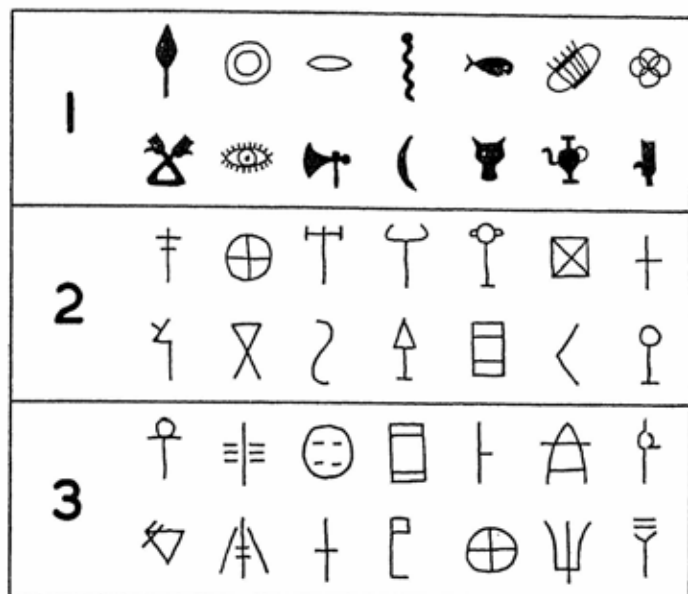
According to Greek legend, a powerful monarch by the name of Minos held sway on the island in the days before the Trojan War. At his Court dwelt the celebrated architect Daedalus, who had fled there

from Athens, and who was commissioned to design living quarters for a monster which was half bull, half man. The design took the form of a complicated labyrinth, into which the dreaded creature was let loose. It was known as the Minotaur, and as it had a taste for human flesh its royal owner decreed that every nine years the subject Greek city of Athens should send a tribute to Crete in the guise of seven youths and seven maidens, to help feed the imprisoned beast. With the third batch of intended victims, however, went Theseus, son of the Athenian king, armed with a plan to bring the sacrifices to an end. As part of his scheme he gained the affection of Minos' daughter Ariadne, thanks to the assistance of whom he entered the labyrinth possessed of a ball of thread (which he paid out as he went, and was thereby enabled to retrace his steps) and a sword (with which he duly slew the monster).

It will be evident that this story relates much that is highly improbable, not to say downright impossible. But, as in the case of Homer's version of the Trojan War, this is not to say that it has no basis whatever in actual fact. If nothing else, it suggests the one-time existence of a highly energetic community on the island, whose rulers had extended their influence to the European mainland. But until the beginning of the present century this was no more than a subject for speculation, for the island still awaited the coming of its Schliemann.

In 1886 Arthur Evans, Keeper of the Ashmolean Museum in Oxford, was sent a Cretan seal-stone, upon which were engraved some unfamiliar hieroglyphic markings. Intent upon following up this

clue, which he believed might lead to the discovery of pre-Greek written records in the Aegean region, Evans journeyed to Crete, and after making an exploration of the island purchased a part of a



Cretan writings. The hieroglyphs (1) were followed by the Linear A symbols (2), which the Mycenaeans in due course adapted to their language (Greek), so giving rise to the Linear B script (3).

ruined site at Knossus, and later acquired the whole of it.

The task of excavation was begun in March, 1900, and within a week a large number of inscribed clay tablets were found, though the writing they bore

was unlike the hieroglyphic symbols which the seal-stone displayed. This new script was called Linear B, in order to distinguish it from another style of writing which it closely resembled, known as Linear A, and also from the hieroglyphs.

All attempts to make sense of these writings failed, but in the meantime Evans had become fully absorbed in the excavational side of the enterprise, which had revealed the remains of what had evidently been a royal residence of considerable extent. Altogether, the site occupied about five acres, and by the end of the first season much of the main building had been uncovered. It comprised a veritable maze of halls and courtyards, corridors and rooms, located at various levels and connected by stairways. There were administrative offices, workshops, and storehouses, not to mention a council chamber and a throne room, complete with an imposing stone chair. And the living quarters, surprisingly enough, contained bathrooms replete with cemented floors and earthenware tubs, seemingly with hot water supplies laid on! And as if all this were not enough, other toilet facilities included flush closets served by stored rainwater and an extensive drainage system!

Here, it was clear, there had once flourished a highly civilized community, which Evans, in the absence of any evidence to the contrary and in deference to the monarch of Greek legend, termed Minoan. In all, three main cultural periods of the Cretan Bronze Age were distinguished—Early, Middle, and Late Minoan (EM, MM, and LM), each of which was subdivided into three phases (numbered I—III), indicative of initial rise, sub-

sequent maturity, and eventual decline. Dating was achieved by way of Cretan associations overseas. Thus in 1907, samples of a distinctive, multicoloured pottery belonging to the MM period were discovered at Abydos, in the tomb of the Pharaoh Sesussi III, and this and other evidence enabled the three phases of the Middle Minoan period to be ascribed to 2100-1580 B.C. The other two periods were dated in a similar manner, from which it appeared that EM I began about 2900 B.C. and LM III came to a close about 1150 B.C.

From start to finish the Cretan Bronze Age thus lasted for nearly 2,000 years, though the great palace at Knossus dates from the MM I period, as does another, though smaller, residence at Phaistos in the south of the island. Both these structures suffered partial destruction a number of times, either by earthquake or as a result of attack. But on each occasion rebuilding was undertaken, until there occurred a final demolition at the end of the LM II period, when the entire island was ravaged—the work, it has been suggested, of those Achæan (Mycenæan) sea-raiders whose descendants laid waste the citadel of Troy. And the Knossus ruins in particular, it may well be, with their maze of corridors and underground passages and their rooms decorated with frescoes depicting youths and maidens indulging in the dangerous pastime of bull leaping, gave rise to the Greek legend of the Cretan labyrinth, and of the imprisoned monster whose habitation the place once supposedly was.

As a result of his excavations, Evans was soon satisfied that he knew the answer to the question of

the origin of the Mycenaean civilization which Schliemann had uncovered: the Bronze Age culture of the mainland had been the outcome of Minoan conquest and colonization. But some doubts about this were raised in 1915, when C. W. Blegen, while excavating in Greece, found stratigraphic evidence of Early, Middle, and Late Helladic sequences corresponding to those of Crete, and during the next five years there was found an ever-increasing amount of evidence to suggest that the arrival of the Greeks in Greece had coincided, not with the onset of the Iron Age, but with the start of the Middle Bronze Age.

This was a revolutionary thesis which Evans steadfastly refused to accept, the more so as it was maintained by the mainland excavators that the Helladic civilization, though doubtless influenced by that of Crete, had been largely independent of it. It was even argued, indeed, that the cultural and other evidence which Evans regarded as proof of Cretan conquest of the mainland could be interpreted the other way about, and that it might well be indicative of mainland control of Knossos!

Here the matter rested until Blegen, digging at the site of what was reputed to be the palace of Nestor at Pylos, unearthed an archives room containing several hundred clay tablets, the writing on which proved on examination to be identical with the Linear B script! Still more of these tablets were later found at Mycenae and elsewhere on the mainland, and it soon became apparent that this particular script was far more widely distributed there than it was on Crete itself, where, unlike the Linear A, it was confined to Knossos.

In this significant fact there was seen further evidence in support of the theory of a period of Mycenaean control over Knossus, though Evans and his followers doggedly maintained that it merely provided confirmation of Cretan control of the mainland—an *impasse* which only an understanding of the Linear B script could be expected to resolve.

At this time, however, decipherment seemed as far off as ever, and, in the event, Evans died convinced that he was right, and blissfully unaware that he was wrong. But soon afterwards, in 1952, Michael Ventris succeeded in demonstrating that the underlying language of the Linear B script was in fact Greek, a momentous discovery which, as may be imagined, did much to clear the archaeological air.

The Greeks, it was now evident, *had* reached Greece during the Bronze Age, displacing (or absorbing) in the process a non-Indo-European people who left behind them a series of non-Greek place and other names, such as Korinthos, Parnassos, and Mykene. The Greek influx came from the north, and soon after their arrival the invaders split into two main groups. One of these contingents—the Dorians—moved into the mountainous region of Epirus, there to remain, cut-off and isolated, for centuries. The other continued to move southwards, among other places reaching Mycenae, which by 1600 B.C. had become the centre of a flourishing civilization which in due course gave rise to the Achaeans of Homer.

On Crete, meanwhile, there had been established a rival Bronze Age culture, emanating, it has been

suggested, from Asia Minor. Writing appears to have been introduced to the island from Egypt, though the seal-stone hieroglyphs, as first used there, represent an independent development which later gave rise to the Linear A system. This, though

PHOENICIAN				
EARLY GREEK				
ETRUSCAN				
EARLY LATIN				
MODERN ROMAN				

After the destruction of the Mycenaean civilization by the Dorians, the Greeks adopted a Phoenician script. It was later acquired by the Romans, who received it, in all probability, by way of the Etruscans. Note the reversal of the signs which occurred when the right-to-left Phoenician mode of writing was changed, so that it became left-to-right.

similar in many respects to the Linear B, apparently expresses a non-Greek, non-Indo-European language which has yet to be deciphered. As for the Linear B script, it now seems clear that when the

Mycenaeans acquired control of Knossus they adapted the native Minoan Linear A script to their own language, incorporating many of its symbols unchanged.

In all, the Mycenaeans appear to have flourished, without serious interruption, from 1600-1200 B.C. But not long after their last great exploit—the taking of Troy—they were called upon to face the irruption of their erstwhile brethren, the iron-possessing Dorians, whose superior weapons they were unable to withstand. The culture of the Mycenaeans perished with them, and it was three centuries or more before the art of writing appeared among their primitive successors. Moreover, when it did so, it was in the guise, not of a Minoan inspired syllabary, but of the Phoenician alphabet, brought to them by Semitic traders from across the sea.

Chapter Eight

THE AMERINDIANS

THE Americas (North, Central, and South) were so named by the geographer Martin Waldseemüller after Amerigo Vespucci, whose voyages during 1499-1502 convinced him that the land found by Christopher Columbus a few years earlier was a New World, and not the eastern coast of Asia as had been supposed—a misconception which had led the discoverer to describe the native inhabitants as *Indians* (a name which subsequently proved to be not altogether inappropriate, as will be seen).

But if the hitherto unsuspected existence of another continent had been revealed, to what race of people did the so-called Indians really belong? This was a question which gave rise to much solemn debate at the onset of the 16th century, for scripturally the peoples of the New World could not be accounted for. After the Deluge, as everyone knew, the population of the world had sprung from Noah's three sons—from Shem, the (Semitic) Hebrews and Arabs; from Ham, the (Hamitic) Egyptians and other African peoples; and from Japeth, the (Japethic) Greeks and their fellow Indo-Europeans.

As a way out of the difficulty it was suggested

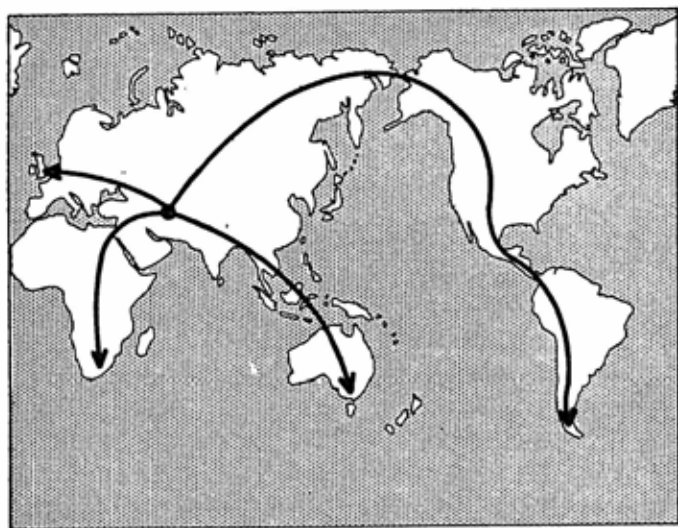
that perhaps the beings who populated the Americas were devoid of souls, and so were not to be regarded as members of the human race at all. But in 1512, Pope Julius II, an intelligent and far-seeing administrator, wisely put an end to such mischievous ideas by decreeing that the newly discovered peoples unquestionably owed their parentage to Adam and Eve.

But this authoritative declaration, though it relieved the situation in part, also served to promote speculation of another kind. For in this event, by what means had the Amerindians managed to escape the Flood? Had the supposedly universal Deluge not, after all, been universal? Or had there been a second ark, whose occupants had made their way in it to the New World when the flood waters subsided?

In 1590, a Spanish cleric by the name of José de Acosta, in search of a more likely explanation, made the suggestion that the first persons to reach the Americas were probably mariners who had been blown far off course by a storm at sea. But as he fully realized, while this might account plausibly enough for the presence of mankind in the New World, it did nothing to explain the abounding animal life which also flourished there. Presumably these creatures had sprung from those animals which had disembarked from the ark somewhere in Western Asia, and as they could not possibly have swum to their new abode they must have made their way to it on foot. Satisfied that this offered the only acceptable explanation, de Acosta boldly postulated the existence, somewhere in the unknown north, of a land bridge between the Old World and

the New. And geographically, at any rate, he happened to be right.

In later years, scientific enquiry, untroubled by preconceived and outmoded theological notions, first had to consider another possible explanation—



There is reason to believe that mankind first appeared in southwestern Asia. The map indicates the course of the four main migratory movements which subsequently led to the populating of the world.

the possibility that man was autochthonous in the New World, that he had evolved there in much the same way as he had emerged in the Old World. That this was *not* the case, however, was convincingly shown by the fact that the higher primates were unrepresented in the Americas, quite apart

from the circumstance that evidence of Palaeolithic cultures also appeared to be lacking. It thus seemed reasonably certain that man was a comparative new-comer to the land, and that his sojourn there could hardly have exceeded 25,000 years, and that in all probability it was considerably less.

There remained the question of route, about which various theories had been advanced, among them the idea of a sea-borne invasion from Polynesia and elsewhere in the Pacific. But in 1728, the Arctic explorer Vitus Bering discovered and gave his name to a narrow strait which separates Siberia from Alaska, and so provided evidence which recalled the land bridge theory of de Acosta. For between 10,000 and 20,000 years ago, when the northern icecap was much more extensive than it is now, not only would the channel have been narrower because the level of the sea would be lower, but it might also be expected that during the winter months at least, the water it contained would be frozen over.

Confirmation that mankind had succeeded in reaching the New World by this path was offered by the distinctly Asiatic appearance of the Eskimo, the most northern, and hence the most recent, of the newcomers. As for those who had preceded the Eskimo, and who in the course of their wanderings had spread to all parts of the continent, although the physical attributes displayed by their descendants are now so diverse that they cannot be held to be those of a single, well defined racial group, the Amerindians nevertheless possess certain characteristic features in common which proclaim their Mongolian ancestry—*e.g.*, prominent cheek bones,

coarse, usually dark, hair, and a yellow-brown skin. But this, of course, does not exclude the possibility that there were also other migrants belonging to different racial groups.

Ethnologically, indeed, there is evidence to suggest that while the Siberian Mongoloids (the round heads) largely predominated, they were early joined by people of European stock (the long heads) who contrived to reach the New World by way of Greenland. At all events, there are envisaged successive waves of immigrants whose descendants gradually, and somewhat sparsely, populated the entire continent, the modern representatives of the firstcomers presumably being the Fuegians who now occupy the tip of South America.

The new arrivals appear to have brought with them such Neolithic appurtenances as stone tools, the fire-drill, the dug-out, the spear-thrower, the bow and arrow, skin clothing, a knowledge of basket-making, and to have been accompanied by the domesticated dog. For the rest, the development of higher cultures is believed to have taken place independently in the new environment, developments which led to a widespread introduction of agriculture, weaving, and pottery making, while in certain favoured areas there were some other notable attainments, particularly in the realm of architecture and astronomy.

These higher cultures were restricted to Central America and to the middle Andean country of South America, in which regions there flourished the Aztecs of Mexico, the Mayas of Guatemala and Yucatan, the Chibchas of the Colombian plateau,

and the Incas of Peru. Each of these four civilizations enjoyed a prosperous agriculture based on maize, mandioca, beans, and the potato, and each, in its turn, was ruthlessly destroyed by bands of Spanish adventurers (the *Conquistadores*) who flocked to the New World in the wake of Columbus, intent upon the acquisition of gold, land, and slaves. And thanks to the exhibition of wanton vandalism which everywhere ensued, much that we should like to know about the achievements and the early history of these Amerindians has been irretrievably lost.

Contemporaneous Spanish accounts, however, coupled with the results of archaeological research, have provided a great deal of information about these now vanished civilizations, foremost among which were those of the Mayas and the Incas.

The Incas were the successors to a series of Andean cultures which developed in coastal and highland regions, and the beginnings of which have been traced back for some 2,000 years. But whereas the lowland Nazcas and Chimus produced an adobe architecture, their subsequent association with the upland Aymaras of Lake Titacaca gave rise to massive stone structures of such solidity that the remains of some of their elaborate stairways and carved monolithic gateways can be seen to this day.

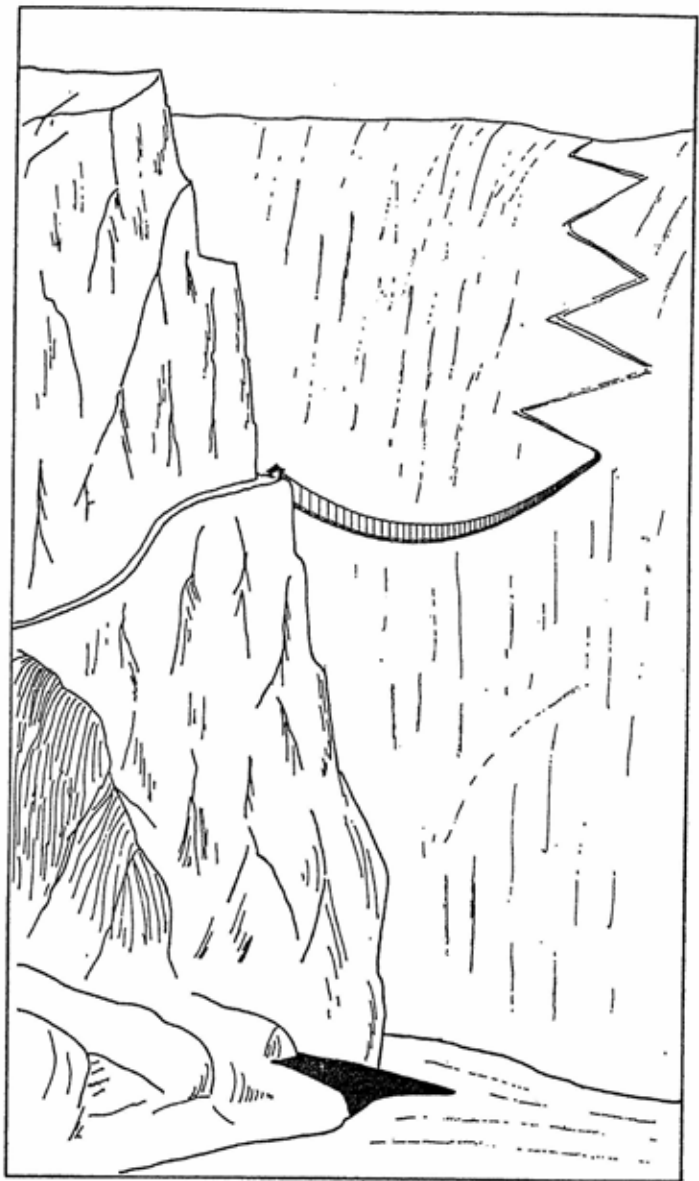
According to tradition, it was from this vicinity that the first Inca made his way to the Cuzco valley, and there founded the capital city of that name. However this may be, by the beginning of the 12th century A.D. the Inca Roca had established himself at the head of a tribe of Quechua Indians, a small community which contrived to extend its influence

by an unrelenting policy of conquest and assimilation. Each successive ruler continued the process, with the result that several centuries later the Inca held sway over most of Peru, much of Ecuador, and considerable areas of Chile, Bolivia, and Argentina.

It has been estimated that control was eventually established over an area of more than 150,000 square miles, with a resident population numbering about 10,000,000. At all events, the empire which thus emerged constituted one of the greatest planned societies the world has seen, in which the loss of personal liberty was the price paid for economic security. While no one among the subject peoples was allowed to starve, all citizens were required to perform certain allotted tasks. Also obligatory was the use of the Quechua language, and the worship of the sun and his terrestrial representative, the semi-divine Inca. Marriage, too, was compulsory, for the family, not the individual, was the recognized social unit.

Groups of 10, 100, 500, 1,000 and more members were organized, each with a leader who was responsible to the head of the next largest unit, until, by way of four viceroys, each of whom was in charge of one quarter of the kingdom, the Inca himself was reached—the supreme and absolute monarch, the revered son of the sun.

This elaborate political edifice was sustained by a large and well organized army, the mobility of which was ensured by a number of outstanding engineering achievements. The effective control of the empire, alike in peace and in war, called for a reliable and speedy means of travel and communi-



How the Incas carried their highway over the Apurimac River. The bridge was suspended across the chasm, three hundred feet above the rushing waters below.

cation. Both were provided by a network of roads which Gutiérrez de Santa Clara, who had occasion to make use of them not long after the Spanish Conquest, declared to be superior to those of the Romans.

The highways of the Inca were often paved with heavy stone flags, surfaced with bituminous cement, and in the absence of wheeled traffic they were constructed with a view to their being negotiated by men travelling on foot and by convoys of laden llamas, the only beast of burden. But their most remarkable features were occasioned by the difficult nature of the terrain through which they had to pass.

In the course of the 2,000-odd mile journey from Chile, *via* Cuzco, to Quito, there was entailed the crossing of extensive deserts and almost impenetrable mountain ranges. In the highlands, deep ravines were negotiated along the tops of fillings of masonry, or by way of suspension bridges, some of them 200 feet long, hung from thick cables of woven fibre the ends of which were anchored to stone towers on either bank, while the challenge offered by steep precipices was met by resort to tunnels, or by means of stairways, hewn out of the rock.

These roadways were complete with the equivalent of milestones and a regular succession of inns, storehouses, and guard posts, and their use was reserved for the litter-borne Inca, and for those engaged upon his business. Along them armies could advance at speed, while the messengers employed to summon military assistance in time of need could travel faster still. By operating a relay service, runners stationed at the various posts could cover distances of up to 150 miles a day, and news of

events of vital import to the well-being of the state was thus able to reach the Inca from the remotest parts of the realm in very short time. In the absence of writing, intelligence reports were conveyed with the aid of code words and by means of the *quipus*, a meaningful array of coloured and knotted cords.

The last Inca to reign over an undivided empire before the coming of the Spaniards was Huayna Capac, a powerful monarch who died on the eve of his country's downfall. For the disaster which followed he must share the blame, in that he was unwise enough to name two of his many offspring as his successors, dividing the kingdom between Huascar, the rightful heir, and Atahualpa, a favourite son by a secondary wife. Inevitably, the two half brothers quarrelled, and within a few years of their father's death civil war broke out.

In the struggle for power which followed, Atahualpa defeated and captured Huascar—at which opportune moment Francisco Pizarro and a handful of Spaniards arrived on the scene, and hastened to take full advantage of the prevailing uncertainty. By an act of treachery, after professions of friendship had been exchanged, Atahualpa was seized and made prisoner, and although the Indians outnumbered the intruders by many thousands to one they hesitated to attack lest harm should befall their captive leader.

In the uneasy truce which followed, Atahualpa was not slow to observe his captors' insatiable greed for gold, and in return for the promise of his freedom he undertook to fill the room in which he stood with objects made of the precious metal, and

to fill a smaller room which adjoined it twice over with objects of silver. A bargain to this effect having been made, royal couriers were despatched to all parts of the kingdom, and before long the first of the awaited shipments began to arrive.

The task of melting down the gold and silver objects, though it went on ceaselessly by day and by night, required a month to complete, and when at last the ransom came to be counted it amounted to the stupendous total of 1,326,539 *pesos de oro*, and 51,610 *marcos de plata*—in terms of present day values a sum in excess of £5,000,000!

Atahualpa now began to demand his freedom, but though he had faithfully kept his promise it quickly became apparent that the Spaniards were not disposed to keep theirs. While the treasure had been arriving they had received strong reinforcements, and they no longer feared attack. Accordingly, they cold-bloodedly strangled their royal prisoner and then brutally suppressed the uprisings which followed.

Thus perished a remarkable civilization of which little trace now remains, apart from the widely scattered ruins which serve to indicate the extent of the Inca's domain when the empire was at its height, and to demonstrate the lasting quality of its stonework.

One secluded retreat which the Spaniards failed to find was recently discovered in a good state of preservation, despite the fact that its long deserted buildings were overgrown with shrubs and trees, some of them with trunks two feet thick. This was the citadel which the archaeologist Hiram Bingham, in

1911, found perched on the top of a mountain known as Machu Picchu, in the vicinity of the awesome Urubamba valley—the first, it may be, of a series of hidden strongholds which still await some fortunate discoverer.

Unlike the unified kingdom of the Incas, the so-called empire of the Mayas was composed of a collection of city states, each governed by local rulers. These independent communities were the outcome of a development which had begun more than 2,000 years earlier, in a region which now includes most of Guatemala, portions of San Salvador and Honduras (including the whole of British Honduras), together with the Mexican states, in whole or in part, of Yucatan, Campeche, Tabasco, and Chiapas—in all, an area of some 125,000 square miles.

By about the middle of the 14th century A.D. the emerging civilization had become well established, and 300 years later the classic age of Mayan culture began. This, the period of the so-called Old Empire, lasted until about A.D. 1000, whereafter, it has been conjectured because of soil exhaustion, the Mayas deserted many of their cities and congregated in the northern part of the peninsula of Yucatan. Here, in what is known as the New Empire setting, a triple alliance was formed between the cities of Chinchin-Itza, Uxmal, and Mayapan (the League of Mayapan). This pact, which endured for 200 years, was ended by an outbreak of civil strife which left the contestants in no condition to offer an effective resistance to the Spanish invaders who undertook the conquest of Yucatan in 1527, after a series

of encounters with some of the inhabitants from 1511 onwards.

The greatly inferior weapons of the Mayas, who, unlike the Incas, made little use of copper or bronze, were no match for those of the Europeans, who in addition to their steel armour also had a tremendous advantage in their possession of that frightening monster, the horse. The defenders, for their part, were armed with flint-tipped spears, bows and arrows, slings, and hardwood clubs and swords, set with blades of obsidian (a natural glass of volcanic origin). A less conventional, and at times no doubt more effective, weapon was the Mayan equivalent of the hand grenade, in the shape of a hornet's nest. But the one great advantage which the Indians possessed—their overwhelming superiority in numbers—was nullified by their internal dissensions. Some sections of the natives actually sided with the Spaniards as a means of settling old scores, while others remained aloof and neutral, and in these unhelpful circumstances the eventual outcome was hardly in doubt, though it was many years before the last of the Mayas was subdued and the conquest could be regarded as complete.

From the accounts given by the Spanish chroniclers of the day, with their references to such northern cities as Coba, Mayapan, Merida, Uxmal, and Tulum, it would seem that little was known about the much greater concentration of Old Empire sites several hundred miles to the south, which by this time had been swallowed up and hidden by the ever-encroaching jungle.

News of their existence was eventually given to

the world as a result of the exploratory wanderings of J. F. Waldeck, J. L. Stevens, F. Catherwood, A. Maudslay, and others, who penetrated the wilds of Guatemala and Honduras during the 19th century. Here they came upon the overgrown and crumbling remains of groups of truncated pyramids—tall, flat-topped stone platforms approached by steep flights of steps running up their sloping sides, on which the Mayas built their palaces and temples. Also encountered were many stone monoliths, elaborately carved, and each bearing the date of its erection, finds which continue to be made to this day. In 1946 some *chicleros* (chicle gatherers) happened upon the site of Bonampak, in the wilds of the Mexican state of Chiapas, and subsequently guided an American expedition to the ruins. These were remarkable in that one of the buildings contained hundreds of square feet of frescoes in brilliant colours, depicting dances, ceremonies, and scenes of battle.

The Mayas dated their monuments and buildings by means of a system of glyphs, while calendrical and astronomical records were also kept, use being made of manuscripts of sized agave-fibre paper. But thanks to the fanatical bigotry of Diego de Landa, Bishop of Yucatan soon after the Conquest, all the Mayan documents which could be found were consigned wholesale to the flames, with the lamentable result that today no more than three of these native books are known to exist, and only some of the glyphs they contain can be understood.

It is known, however, that the Mayas evolved a conception of zero, and that a dual calendrical

system of reckoning was employed, in which a sacred interval of 260 days, made up of 20 day-names in association with the numbers 1-13 ($20 \times 13 = 260$) ran concurrently with a secular year of 365 days. This last consisted of 18 periods, the equivalent of our months, each containing the 20 named days aforementioned ($18 \times 20 = 360$), to which 5 unnamed days were added, making 365 in all. These two cycles together gave rise to what is known as the Calendar Round, an interval of 52 years or 18,980 days, each of which was distinguished by a particular combination of names and numbers—*e.g.*, 4 Ahau 8 Cumhu.

It so happens that the day known as 4 Ahau 8 Cumhu is of special significance, for the Mayas regarded it as marking the beginning of their era, from which arbitrary starting point it was their custom to calculate the number of days which had elapsed to the date of some event considered to be of sufficient importance for it to be commemorated by the erection of a stele. This reckoning, known as the Long Count, employed a (predominantly) vigesimal (20) system of numeration in which the day, Kim, was used in conjunction with the Uinal (20 Kims), the Tun (18 Uinals), the Katun (20 Tuns), the Backtun (20 Katuns), and the Pictun (20 Baktuns). In other words, 1 Pictun amounted to $20 \times 20 \times 20 \times 18 \times 20 = 2,880,000$ Kims. And in precisely the same way that the position of a given day in the Calendar Round was given by glyphs representing its names and numbers, so its position in the Long Count was shown by a so-called Initial Series date, such as 9.10.19.13.0.—*i.e.*, 9 Baktuns, 10 Katuns,



The Mayas employed a vigesimal (twenty) system of counting. In addition to using combinations of dots and bars (in which a dot=1 and a bar=5), the numbers 0-19 were also indicated by means of the glyphs shown above. The identity of head No. 11 is questioned by some authorities.

19 Tuns, 13 Uinals, 0 Kims, indicating that a period of 1,375,100 days had elapsed since the inaugural date.

But in what year of our system of reckoning does the day 4 Ahau 8 Cumhu fall? The experts for long differed widely in the answers given to this crucial question, their estimations varying by almost 1,000 years, and ranging from as high as 3641 B.C. to as low as 2849 B.C. The archaeologist H. J. Spinden favoured 3373 B.C. as the year concerned, and in 1951 a piece of wood from a carved lintel found at the site of Tikal was tested for its carbon 14 content. The lintel bore the Mayan date 9.15.10. 0.0., which according to Spinden's reckoning was 30th October, A.D. 481—an estimation which the carbon atoms exactly confirmed, with a plus or minus of 120 years.

The crowning achievement of the Mayan astronomers was the degree of accuracy exhibited by their estimation of the length of the year. At the time of the Conquest, Europe still made use of the Julian system of reckoning, so-called because it relied on the corrected Egyptian version of Ptolemy III, which Julius Caesar subsequently adopted. It was based on a tropical year of 365.2500 days, as compared with the true value of 365.2422 days, with the inevitable result that, by the 16th century, the civil year had become seriously out of step with the seasons. This state of affairs was eventually corrected by Pope Gregory XIII (hence the present Gregorian Calendar) in 1582. But the Mayas, meanwhile, had long before determined the length of the year to be 365.2421 days, and so in this matter, at least, they were well in advance of their European conquerors!

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